

University of Alberta

"It's Good for Many Things":
Wixárika (Huichol) Ethnoecology of Amaranth

by

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fulfillment of the

requirements for the degree of Master of Arts

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DEDICATION

*This work is dedicated to
Grandma and Grandpa Sheets
for teaching me how to gather plants from the wild.*

ABTRACT

Wixárika (Huichol) people of northwest Mexico use two species of the plant, amaranth: *Amaranthus hypochondriacus* and *Amaranthus hybridus*. Wixárika interactions with the two species are examined based on Victor Toledo's framework for ethnoecological studies. *A. hypochondriacus* is domesticated and its seeds have important nutritional and religious significance. Wixáritari (pl.) believe that these seeds are a manifestation of the ancestor deity, Amaranth Boy, who discovered maize in the form of young maidens. The undomesticated *A. hybridus* grows in areas where there are disturbed soils. Wixárika people manage this plant by allowing it to grow to an appropriate size and then harvesting it as a famine food during the weeding process. Wixáritari have both partonomic and phenological plant classification systems. Close Wixárika relationships with humans and plants demonstrate that Wixáritari view the natural world as being familiar and encompassing humans, rather than being separate from daily life.

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CHAPTER 1: INTRODUCTION

This thesis is based on three months of fieldwork that I carried out in the summer of 2004 in northwest Mexico (see Figure 1.1). The Huichol Center for Cultural Survival and Traditional Arts located in Huejuquilla el Alto, Jalisco introduced me to Wixárika (Huichol) people mostly from the communities of Nueva Colonia and San Andrés Cohamiata. Some of these people from the Huichol Center invited me to their homes in Nueva Colonia and surrounding area and acted as patient teachers. Such teachers taught me about their uses, management, oral traditions, and naming of local varieties of amaranth.



Figure 1.1 Map of Wixárika geography. By Patricia Díaz Romo and Nancy Moyer (Schaefer 2002: 5).

In this chapter, I provide background on Wixárika people, relevant amaranth species, and ethnoecological theory. The next three chapters will each include a brief literature review that relates Wixárika ethnoecology to Toledo's framework. I will then conclude with a discussion of the relevance of amaranth in Wixárika ethnoecology and with suggestions for further study. Throughout this thesis, I refer to the people that I worked with, as "Wixáritari" (pl.), or "Wixárika" (sing.). They are more widely known as "Huichols" in English, or as "*Huicholes*" in Spanish. Stacey B. Schaefer claims that the name "Huichol" is the name that early Spanish chroniclers used for the indigenous group and people have continued using it since then (Schaefer 2002). As Schaefer experienced, I found that the individuals with whom I interacted referred to themselves as, and preferred to be called, "Wixárika", since it is their word for themselves and likewise the name of their Uto-Aztecan language.

Wixáritari

Introductions to ethnographic works on Wixárika people tend to emphasize that Wixáritari have maintained a traditional way of life in comparison to many other Mexican indigenous peoples. For example, Schaefer describes how the remote area of the Sierras has allowed Wixáritari to "maintain...life ways deeply rooted in Prehispanic traditions and beliefs" (2002: 11). Hope MacLean also notes how Wixáritari have retained their culture and language through a combination of retreating to the mountains and by maintaining diplomacy (2001: 305). Stacy B. Schaefer and Peter T. Furst claim that the most important aspect of Wixárika cultural continuation is the fact that they have maintained their religion without significant syncretism (1996a: 1).

The states in the Sierra Madre Occidental that are home to the Wixáritari

(Zacatecas, Jalisco, Nayarit, and Durango) were not brought under Spanish rule until 1722. Since then, mestizo (people of mixed Indigenous and Spanish origins) farmers have taken over some of the outer regions of original Wixárika territory. However, the steep canyons of the Chapalagana River make many parts of the Wixárika homelands inaccessible to outsiders. This geographical isolation and historical and religious factors have influenced Wixáritari from adopting Catholicism.

In 1972 Phil Weigand described how the 1910 Mexican Revolution influenced continued Wixárika isolation and their current social organization that is based on religious districts. In the early 1900s, mestizos used Wixárika community land for cattle pasturage at will. Then, in 1913, the revolutionary, Pancho Villa, arrived in the area and the local mestizos joined his cause. The Wixáritari saw this conflict as a chance to regain their territory and so they united against Villa. Although many of the local ranches were damaged during the conflict, the Wixáritari managed to evict most of the outsiders from their territory.

Turmoil started again in Wixárika communities when a mestizo priest arrived in the 1920s. He was a part of the larger *Cristero* movement that argued against the state; that it should be destroyed in the name of Christ. According to Weigand, Wixáritari saw the *Cristero* struggle as an opportunity to gain more land and to loot local mestizo farms (1972: 20). Other Wixáritari feared more fighting and unrest and fled their communities. By the 1930s, federal units and their supporters defeated the *Cristero* forces, which included Wixáritari and other indigenous people. The victors raided community lands and drove away people and livestock. Large areas of land became depopulated as people retreated deeper into the canyons and into settlements outside of the community lands.

Once the government forces retreated, many Wixáritari returned to their communities, but they found that mestizo ranchers were occupying much of their land again (ibid.). Consequently, many individuals did not return to their original temple districts, but instead integrated into districts where other Wixáritari had continued living during the conflicts. Weigand claims that this mixing broke down previous kin-based temple districts and replaced them with existing Wixárika district populations (ibid.: 22). Memories of such conflicts have added to a current general Wixárika distrust for Catholic priests and outsiders who enter their territories.

Wixáritari have self-governing districts that are divided amongst bilateral extended families who share homesteads, and as long as their land is worked, families can pass it on to succeeding generations (Schaefer 2002: 18). The existing districts, or *comunidades* ('communities'), are San Andrés, Guadalupe Ocotàn, San Sebastián, Tuxpan de Bolaños, and Santa Catarina. A community is a corporate entity that the Mexican government recognizes if its members demonstrate a prior, longstanding, community-based use of land and waters (Toledo 2001). A community differs from an *ejido*, the other form of community-based ownership in Mexico, in that groups can petition for access to new land-based resources on land that they did not previously use when they have rights to an *ejido*. The community-based tenure protects the local resource management systems that are often adapted to local ecology (ibid.: 475).

Wixárika *ranchos*, or homesteads, are associated with certain temple groups within a district, and each temple district is subsequently associated with a ceremonial centre. Governing officials live at the ceremonial centres and a growing number of Wixáritari also live in these areas (ibid.). However, with a population of just over 30, 686

people who speak Wixárika, almost half of them live in or around cities, particularly in Tepic, Nayarit and Guadalajara, Jalisco (2000 XII Censo General de Población Vivienda). Although many people live outside of their communities, they return home for religious ceremonies and to help work in the family fields whenever they can. Most Wixárika express a preference to be in the Sierra, and say that they only leave in order to earn money.

On their homesteads, people practice shifting agriculture by using digging sticks, wooden ploughs, and draft animals, which they supplement with hunting and gathering. Most people spend the rainy season (May to October) on their homesteads working in their *milpas* (small crop fields/gardens), and then migrate for outside work during the rest of the year. The principle Wixárika crop is maize (*Zea mays* ssp. *mays*) and is of central religious significance. For example, Wixáritari identify five different varieties of maize depending on the kernel colour (white, red, yellow, mottled, or blue), and they consider each of these colours of maize to be a maize maiden, who *Watakame* (the Clearer of Fields or Amaranth Boy) found and brought back to the Wixárika people.

Mara'akames are important figures in Wixárika religion, as these individuals act as shamans, healers, leaders, and priests and are therefore major figures in maintaining Wixárika society. Wixáritari believe that *Mara'akames* have the ability to access other worlds and can transform themselves into animals. They also have the ability to fly to the land of the gods and to follow the souls of the dead into the underworld. Parents pay special attention to their children to see if they have such abilities, and a typical way to determine if a child is a *mara'akame* is if the child reacts agreeably to his or her first taste of the bitter alkaloid-rich cactus, peyote (*Lophophora williamsii*) (Schaefer and Furst: 1-

11).

Peyote is at the crux of a *mara'akame*'s cosmos and it is an integral part of the annual ceremonial cycle for Wixáritari. Wixáritari go on peyote hunts and travel hundreds of kilometres to the San Luis Potosí desert to do so. Schaefer and Furst suggest that this peyote hunt is the last survivor of an ancient Chichimec/Desert Culture peyote complex (ibid.: 23). The term "hunt" refers to Wixárika deer, maize, and peyote symbolism. For Wixáritari, deer, maize, and peyote are all the same and people often refer to the peyote they gather as the flesh of deer, and the taproot of the cactus that they leave in the ground as the bones.

Based on peyote induced visions and dreams, Wixáritari make colourful offerings to their gods with wax, beads, wood, and gourds. In more recent times (around the 1950s), colourful Wixárika yarn paintings, which are inspired by their more traditional religious offerings, received attention from the outside world (see Appendix A, Figure 1.7) (MacLean 1995: 51). Offerings are made and used for religious purposes, while yarn paintings are made purely for commercial purposes. However, Hope MacLean points out that yarn paintings are in fact offerings despite their sole commercial purpose, because Wixárika mythology describes the act of making yarn paintings as the power of creating the objects depicted in them (ibid.: 50).

Susana Valadez (Director of the Huichol Center) claims that Wixárika art is a direct extension of their religion and it provides a material representation of the most profound concepts (1978: 35). She goes on to state that, "[e]very stitch sewn on to a traditional [Wixárika] item is symbolic of an entire belief system...expressing, recording, and passing on to future generations the important religious concepts represented in these

art forms" (ibid: 35-36). MacLean links the shamanic visions that inspire Wixárika yarn paintings to inspiration from the gods (1995: 153). She notes that most yarn paintings contain culturally derived symbols that relate to Wixárika oral traditions and ceremonies, as opposed to individual innovation or the need to meet commercial demands (ibid.).

Other than making offerings, Wixárika women partake in vision-inspired artwork by weaving. According to Schaefer, weaving is more than an art form, as it is part of a Wixárika women's identity (2002). Through her weavings, a woman demonstrates the changes and transformations that she experiences, as her rites of passages are described through her abilities as a weaver (ibid.: 1). Weaving is such an important part of the women's life that she takes the loom with her to the grave. Women bring money and status to their families by being successful weavers, and they develop their skills through both the physical and metaphysical worlds (ibid.: 2). Weaving is, therefore, a way that a Wixárika woman practices religion.

Religion is a part of everyday Wixárika life, as people consider their surroundings to be alive and therefore to have the capacity for feeling and action (Fikes 1985: 12). Schaefer and Furst refer to the Wixárika religion as being ecological, as opposed to animistic (1996a: 12). Wixáritari have countless deities, because they consider distinct features of the landscape to be gods and each community has different gods of importance. Barbara Myerhoff describes Wixárika religious life as "the good life", meaning that each day is sacred and that to live properly is to be Wixárika (1974: 74).

Landscape

Deep canyons that result from the Chapalagana River and its tributaries carve up the Wixárika homelands. Weigand divides this area into five ecological zones (1972: 7-

8). The first zone contains the Chapalagana riverbed, immediate banks, and the lower pathways of its tributaries, and is from 700-900 meters above sea level. Wixáritari use an abundance of plants and animals from this area. In particular, fish and freshwater shrimp are important food sources. The second zone is about 900-1,400 meters above sea level and encompasses the lower and middle slopes of the river canyons. Wixáritari may live in this area on a seasonal basis for agricultural convenience, but crops grown in this area tend to be less productive than those from plots higher up in the canyons. Much of the vegetation in these two first zones is sub-tropical, and many Wixáritari grow plants such as peaches, mangoes, and plums in these areas.

The third ecological zone contains mesas that are between the middle routes of the tributaries and the main river and are approximately 1,300-1,900 meters above sea level. This area requires extensive labour to clear the heavy vegetation that grows on rugged slopes. Most temples and homesteads are located in this area. The fourth zone consists of high slopes overlooking the upper tributaries of the Chapalagana River. At about 1,800-2,500 meters above sea level, this region supports various wild fruits, grasses, and pine and oak trees. This area is principally used for grazing cattle and is where deer are commonly found. Deer inhabit the fifth zone, which is often called the high sierra, as it is characterized by highland plains at around 2,400 - 3,200 meters above sea level. This area tends to be cooler in temperature and is a common habitat for large birds of prey such as hawks and eagles and small rodents such as rabbits and squirrels.

As Fikes observes, the whole region is characterized by the regular alternation between wet and dry seasons (1985: 59). The dry season typically occurs December through May. Conversely, eighty percent of the annual precipitation falls during the wet

season. Alfonso Fabila estimated that the annual rainfall for the area is 800 millimetres, with just a twenty percent fluctuation (Fabila 1959). Although the rainfalls are somewhat predictable, Wixárika horticulture can be unpredictable. Fikes attributes this agricultural instability to most of the arable land being located on steep slopes (1985: 60). Soil in these areas needs almost constant soaking in order to compensate for rapid runoff, which is a problem because maize requires adequate water during the final stages of growth for the ears of corn to fully develop.

Besides maize, Wixáritari cultivate beans (*Phaseolus* spp.), squash (*Cucurbita* spp.), chillies (*Capsicum* spp.), avocados (*Persea americana*), husk tomatoes (*Lycim torreyi*), guayabas (*Psidium guajava*), and zapotes (*Bletia*). Plants introduced from the Old World include mangos (*Mangifera indica* L.), bananas (*Musa* spp.), peaches (*Prunus persica* (L.) Batsch), and watermelons (*Cucurbita citrullus* L.). Wixárika pick many wild plants throughout the year such as prickly-pear fruits and leaves (*Opuntia* spp.), mushrooms (*Amanita* spp.), plums (*Prunocerasus* spp.), and mesquite (*Prosopis juliflora*). As will be discussed throughout this work, wild greens, or *quelites*, (which include *Amaranthus hybridus*) form an important part of the Wixárika diet during the first months of the rainy season when these plants are small, green, tender, and abundant.

Amaranthus

The genus *Amaranthus* consists of approximately sixty different species that are generally thought of as weeds in North America (Levetin and McMahon 1999: 247). These New World plants can be as tall as 2.5 m and have broad leaves. Young leaves can be eaten like spinach and the plant's purple, red, and gold flowers are often used for decoration (see Appendix A, Figure 1.1) (ibid.). The tiny seeds that amaranth produces

are edible and are also multicoloured (black, cream, brown, tan, or pink) and more importantly, have a protein content from 12.5% to 17.6%, which is comparable to other major cereals (see Table 1.1) (Zheleznov et al. 1997).

As Senft describes, the world's major cereals (corn, wheat, and rice) are deficient in the essential amino acid lysine and in sulfur-containing amino acids (1980: 43). While amaranth seeds have an abundance of lysine, they are deficient in the essential amino acids threonine, isoleucine, valine, and leucin, which are present in the main grass cereals. Therefore, when amaranth is combined with these major staples, the available protein is comparable to the Food and Agriculture Organization/World Health Organization's standard protein requirements (*ibid.*).

Zheleznov et al. summarize the protein value of amaranth by showing that the seed's lysine content is two times greater than that of wheat and three times greater than that of maize (1997: 177). The overall nutritive value of amaranth proteins is 75 on the nutritionist's scale of protein quality, while cow milk rates lower on the scale at 72 (*ibid.*). The authors refer to amaranth as the universal crop because the seed can produce flour, starch, bran, and oil. When eaten as a vegetable, amaranth leaves are rich in carotene, vitamin C, iron, calcium, and microelements (Levetin and McMahon 1999). Between six and ten per cent of the content of amaranth seeds is an oil that is unsaturated and high in linoleic acid (*ibid.*). The oils and starches from amaranth can be used in various non-consumable products, such as in cosmetics and nonallergic aerosols.

Food and Description	Food Energy	Moisture	Protein	Fat	Carbohydrate Total (incl. Fiber)	Fiber	Ash
	Calories	Percent	Grams	Grams	Grams	Grams	Grams
Cereals	343.5	11.6	11.0	2.7	73.0	2.1	1.7
Legumes	344.1	10.6	22.9	1.9	61.1	4.7	3.5
low oil							
Legumes	483.5	7.8	30.1	32.6	26.1	3.7	3.5
high oil							
Nuts	648.0	4.1	15.1	64.3	14.2	2.4	2.4
Greens	35.8	87.9	3.3	0.6	6.5	1.1	1.7
raw							
Amaranthaceae	58.7	81.1	3.0	0.5	13.3	1.8	2.1
raw greens							
Amaranthus spp.	35.6	86.9	3.6	0.5	6.3	1.4	2.6
raw greens							
Amaranthus spp.	382.8	11.3	14.5	7.5	60.4	7.5	2.9
seeds							
A. hypochondriacus	391.0	9.4	9.4	7.1	62.7	2.9	2.6
seeds							
Chenopodium spp.	347.0	11.4	14.8	5.2	63.7	94.0	4.2
seeds							

Table 1.1: Composition of important food crops. Adapted from Elais (1977: 17-21).

Amaranth seeds are relatively easy to harvest, as the plant's inflorescences can be rubbed by hand to break them off, and then the chaff can be winnowed away in a basket (Balick and Cox 1996: 92). Once amaranth seeds are processed, they are easy to digest and therefore people who have been ill or fasting will often consume them (Levetin and McMahon 1999: 247). Uncooked seeds are indigestible and need to be toasted (or popped like popcorn), boiled, or ground into flour (Tucker 1986: 9).

Amaranth is also of importance in horticulture because it has a high tolerance to extreme environmental conditions such as drought, heat, and poor soil conditions

(Levetin and McMahon 1999: 248). This is due to the amaranth's highly efficient C-4 photosynthetic system,¹ which means that it uses atmospheric carbon dioxide efficiently through concentrating it in chloroplasts within specialized cells (Wang et al. 1993). Therefore, by limiting photorespiratory carbon dioxide loss, amaranth can convert a higher ratio of atmospheric carbon into carbohydrate. Amaranth also conserves water, as it can contract its leaf pores (stomates) during photosynthesis, thereby limiting water loss through transpiration (ibid.). Amaranth plants can also make osmotic adjustments, which allows it to be lacking in water but to not wilt. Research suggests that certain subspecies of amaranth can withstand unfavourable soil conditions such as acidity, high salt content, or alkalinity (Tucker 1986: 10).

According to the results from the Tehuacán Archaeological-Botanical project, amaranth is one of three plants that could have been domesticated very early (along with maguey (*Agave* spp.) and avocado (*Persea Americana*)) (MacNeish 1967). Amaranth grows in the wild in many parts of Mexico, and therefore it was difficult for the archaeologists who were working on the project to distinguish the wild from domesticated specimens in their sites (ibid.: 292). Although remains of the plant were consistently found as a result of various excavations during the project, there is no clear evidence of when the plant was first cultivated. However, as archaeologists regularly found the plant, MacNeish speculates that people planted amaranth as early the El Riego phase (6500-5000 B.C.E.) (ibid.). MacNeish also notes that there is archaeological evidence of amaranth in the American Southwest from about 4000 B.C.E. and in southeast Tamaulipas from 2500 B.C.E., but there is insufficient evidence to show whether amaranth was domesticated in one centre and spread, or whether it was

domesticated independently in several locations (ibid.).

Jonathan Sauer argues that people's early interaction with amaranth was likely beneficial to the plant (as cited in Cole 1979: 35). Wild amaranth does not grow in forests or grasslands without human disturbance because amaranth is not successful in shady areas or with competition from larger plants. Instead amaranth grows in less common places such as lakeshores, riverbanks, desert washes, sea beaches, dunes, and coastal marshes, where there is hot and bright sunshine (ibid.). Sauer believes that when humans dropped amaranth seeds that they had collected from the wild, they gave the plant new opportunities to grow in ideal locations that people had already disturbed (ibid.).

Outside of human activity, wild amaranth seeds are dispersed by birds, flowing water, and other agents, and the seeds can lie dormant for years until a disturbance provides the appropriate conditions for them to grow (ibid.: 36). Therefore, amaranth, like many of the important food crops, were well equipped to be "weedy camp followers" of prehistoric hunters and gatherers (ibid.). Garbage piles would have provided ideal conditions for amaranth to grow and it in turn, became a convenient food supply. This relationship between people and useful weeds could be the first step in crop domestication.

Sauer proposes two different hypotheses for the evolutionary origins of seed amaranths (Costea et al. 2001a: 932). The first states that the three domesticated species (*A. hypochondriacus*, *A. cruentus*, and *A. caudatus*) originated from the wild *A. hybridus*. The second proposition is that each of the three domesticated species originated from a different wild species (ibid.). According to this hypothesis, *A. hypochondriacus* came from *A. powellii*, *A. cruentus* from *A. hybridus*, and *A. caudatus* from *A. quitensis*.

Studies based on cytological or molecular methods that have attempted to clarify this issue tend to be contradictory and therefore more research is needed on this topic (ibid.).

Amaranth seed was a major staple in pre-Columbian times in Mexico. For example, the Aztecs used the seed, which they called *huauhtli*, as a tributary to their king (Sauer 1950: 564). The Aztecs also made idols from amaranth dough called *zoale* that they used in elaborate ceremonies. One of the important ceremonies in which amaranth idols were used was a May festival that honoured the war god, *Huitzilopochtli* (ibid.: 567). This ceremony was held at the Aztec capital, Tenochtitlán where temple maidens made a large idol of *zoale* and carried it in on a litter in a great procession throughout the city before returning it to the temple (ibid.: 568). During the final parts of the ceremony, the worshipers broke the idol into pieces and consecrated it as the flesh and bones of *Huitzilopochtli*. All participants had to provide a share of seeds to make the idol, and the dough was the only thing people could eat on the day of the ceremony (ibid.).

Sahagún, the 17th century chronicler, recorded many aspects of Aztec life in the Ramírez Codex (circa 1570). He described *zoale* idols being used in at least seven different ceremonies. For example, he portrayed how people honoured the fire god, *Xiuhtecutli* by creating a *zoale* idol that they threw from a tree, and then the worshipers would scramble for the pieces (ibid.: 569). Sahagún also recorded some ceremonies that involved the use of tortillas made from amaranth leaves. I will discuss contemporary Wixárika ceremonies that mirror these early Aztec ceremonies and practices in the following chapters.

Such Aztec ceremonies are of interest because after the Spanish colonized Mexico, the Catholic church influenced the Aztecs to stop using amaranth ceremonially

as a part of the church's larger fight against non-Christian faiths and idolatry. In general, the Spanish were able to stop large scale amaranth production in Mexico (Sauer 1950: 570). In the 1890s, the Mexican government carried out an agricultural survey that asked farmers to list their crops, which revealed a striking decline in the cultivation of amaranth since pre-Columbian times (ibid.: 577). However, Wixárika people have continued cultivating and using amaranth as a food source and in ceremonies, as will be demonstrated in this thesis.

In recent decades several groups have promoted the re-introduction of amaranth seeds into the Mexican diet. For example, the Mexican government has commercials on the local indigenous radio station telling Wixárika and the neighbouring Cora people to feed amaranth to their children, because, as the commercials claim, the children need the seed's nutrients. Another example is Puente de la Salud a la Comunitaria, which is one of several non-governmental organizations that promotes the revival of cultivation and consumption of amaranth in Mexico. This particular organization is based in Oaxaca state and promotes the cultivation and use of amaranth in communities throughout the region.

One town that has been particularly successful in the cultivation and marketing of amaranth in Mexico, is San Miguel del Milagro, in the state of Tlaxcala. Gail Sobel, a biologist, went to Mexico in search of amaranth for her Ph.D. fieldwork. She found people cultivating amaranth in San Miguel del Milagro, with an astonishing 68% of the population involved in its production (1993: 175). However, Sobel speculates that closer to 90% of the people in the town are involved in amaranth production, and that her statistics are low because she was unable to survey the town's entire population.

People mainly produce amaranth seed in San Miguel del Milagro, which they then pop and make it into *alegrías* (small sweet cakes, 'happiness'). People also use the plant for a wide range of personal food items, such as mixed into different types of drinks, and ground into flour for baking. Many people told Sobel that cultivating amaranth was too much work, and therefore they were no longer cultivating the plant (ibid.: 191). People that continue to grow the plant use machines for harvesting and make either *alegrías* or sell amaranth seeds to *alegría* makers.

Amaranth producers in San Miguel del Milagro formed a co-op in 1986 that received a low-interest loan from the federal government (ibid.: 220). As a part of their agreement with the government, each of the first ten members had to visit four to five other towns and give amaranth demonstrations. The co-op later built a factory that makes *alegrías*, cookies, flour, and cereal for which the local development centre (D.I.F.) has first purchasing rights. One of the founders of the co-op later split off and started a large factory that manufactures amaranth products, but does not grow its own seed. Due to the continued production of the seed in the small Mexican village, many people in the town now know a great deal about its nutritional value and have taken an interest in the indigenous names for the plant (ibid.: 291).

The major agricultural university in Mexico, the Universidad Autónoma Chapingo, has various researchers that have taken an interest in studying and increasing the cultivation of amaranth as well. In 1986, Gabriel Alejandro Iturbide and Federico Gómez Lorence from the Universidad Autónoma Chapingo wrote a book about the cultivation of amaranth in Mexico. The authors provide a history of the plant's use in Mexico based on Sauer's work, but focus more on the available types of domesticated

amaranths and how to grow them in different regions of Mexico. The authors dedicate the book, "to the ancient Mexican agriculturalists, with their ingenious domestication of amaranth, and with whose effort made the continued use of it possible, even after its prohibition in colonial times" (1982, *my translation*).

Theoretical Context

This study will examine the ethnobotany and ethnoecology of Wixárika management of amaranth. The term "ethnobotany" generally refers to the study of the interactions between plants and people. Historically, ethnobotany has been concerned with finding plants of material value for exploitation, be it for materials, food, or medicine (Alcorn 1995: 23). Today, ethnobotanists are more often concerned with conceptualised plant use and include cultural aspects such as religion, symbolism, and plant cultivation in their studies. For example, Richard I. Ford delineates how the development of ethnobotany started with an interest in listing indigenous people's uses of plants and moved to an interest in understanding all cultural aspects of plants (1994: ix-x).

The field of ethnobotany expanded into cognitive anthropology when Harold Conklin published his documentation of Hanunóo plant classification systems in 1954. Within a decade, anthropologists considered ethnobotany to be a part of ethnoscience, which can be defined as the study of any given culture's knowledge and cognition (Alcorn 1995: 24). In order to access such cognition, ethnoscientists record indigenous classification systems, and therefore use methods of recording and analysing language in their investigations. Those scientists who are interested in the classification of living things are known as ethnobiologists.

Ethnoecology can be seen as an extension of ethnobiology to include abiotic components in the environment (Toledo 2002: 512). However, most authors tend to use the term in a much broader sense. In the broadest sense, ethnoecology is defined as the study of the interactions between living organisms and all the ecological and social aspects that they come into contact with in their environments (Blount *cited in* Medin and Atran 1999: vii). The ethnoecological researcher looks at ecological systems from the perspective of the people who participate in them. Robert Bye, Jr. and Maurice Zigmond published perhaps the earliest definition of ethnoecology, which is: "the area of study that attempts to illuminate in an *ecologically* revealing fashion man's interactions with and relationships to his environment" (1976).

Fikret Berkes notes that with an increased appreciation of ethnoscience, scientists from various fields place more value on traditional ecological knowledge (TEK) (1999: 4). Berkes defines traditional ecological knowledge as, "a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment" (ibid.: 8). Scientists now study many types of indigenous environmental knowledge, such as traditional agriculture, pharmacology, water engineering, and architecture. In particular, an emphasis is placed on indigenous groups' ability to apply TEK to current management resource problems (ibid.: 4).

Berkes considers TEK at to have four interrelated levels, with each level being included in the next: local knowledge of plants, soils, animals and landscape, land and resource management systems, social institutions, and world view (ibid.: 13). These four

levels are not always distinct, as for example management systems and social institutions are often inseparable. Also, there is often feedback among the different levels, as knowledge and systems change and grow and affect other aspects of TEK (ibid.: 14).

While acknowledging the significance of TEK for ethnoecology, Victor Toledo identifies at least four different intellectual sources that have contributed to the formation of the sub-discipline (1992). The first source is anthropology, and in particular ethnoscience, new ethnography, and semantic anthropology (ibid.: 6). The second and most influential source is the large collection of existing ethnobiological studies, which consists of knowledge classification, use, and management of life forms, and often also includes abiotic factors (ibid.: 7). Notable authors in this area are ethnobotanist, Janis Alcorn and her discussion of natural resources and economics, and ethnozoologist Darrell Posey and his promotion of an ethnoecological perspective on development of the Amazon (ibid.).

The third intellectual source that contributes to ethnoecology is agroecology (ibid.). This field of study is focused on agriculture and lacks a holistic and culturally based perspective, but in turn, allows for shorter and more quantitative investigations (ibid.). The fourth intellectual source for ethnoecology is environmental geography, which focuses on systems of traditional resource management. Environmental geography differs most drastically from ethnobiology, as it concentrates on techniques of natural resource management as structures of the environment that are separated from their cultural and ecological contexts (ibid.: 9).

Although ethnobiology may be one of the more prolific sources for ethnoecology, Toledo criticizes it as being a closed discipline that does not assess the practical problems

of agriculturalists as a part of an ecosystem (ibid.: 8). He stresses that ecosystems are used, managed, and understood by indigenous people, which is not always recognised in ethnobiological studies. Eugene Hunn has also criticized ethnobiology for not assessing the practical aspects of indigenous ecological knowledge (1982). He feels that ethnobiologists have taken the practical wisdom of their informants for granted and faults studies from that time for excluding "functionally motivated categories" from their analyses of folk taxonomies (ibid.: 832). Hunn calls for ethnoecological research that acknowledges that cultural knowledge is adaptive and that integrates cognitive, linguistic, and evolutionary theory (ibid.: 844).

In the introduction to her edited volume, "Ethnoecology: Situated Knowledge/ Located Lives", Virginia D. Nazarea also argues for a more encompassing ethnoecology (1999). She believes that the ethnoscientist needs to explore the connection between folk classification and cultural conceptions of landscape and its subsequent management (ibid.: 7). Nazarea claims that, "we [need to] shift our attention from relations of similarity or paradigmatic alliances captured by our neat but static taxonomic trees to relations of continuity, embracing both syntagmatic and diachronic flow" (ibid.).

In response to some of the criticisms of ethnobiology, Toledo provides a framework to unite the ethnoecological aspects of classification and management (2002). He envisions ethnoecology as a discipline that covers the inseparable domains of landscape, which are culture, production, and nature (ibid.: 514). This viewpoint allows ethnoecology to be an interdisciplinary approach that focuses on the *praxis* (set of practices), the *kosmos* (belief system), and the *corpus* (cognitive systems) of a group of people (ibid.).

Toledo elaborates on the term *praxis* as ecological exchanges that make up indigenous peoples' subsistence strategies (ibid.: 517). These exchanges are based on non-specialized production that maintains a diversity of resources and practices for a high self-sufficiency in indigenous households and communities. Maximum utilization of the landscape is manifested through the recycling of materials, a wide range of resources selected from the ecosystem, and the integration of different resource accumulation practices such as hunting, gathering, horticulture, fishing, and agroforestry (ibid.). Meanwhile, habitat patchiness and genetic variation are maintained through such practices.

Toledo defines *kosmos* by defining indigenous cosmovisions, which he believes reflect that for most indigenous people, land is inalienable, revered, and respected as the primary source of life (ibid.: 515). Toledo makes the assumption that indigenous peoples in general have a belief system about nature, which Western thinking typically lacks. He claims that nature is, "the core of culture and the origin of ethnic identity" (ibid.). The indigenous cosmovision (which is reinforced by people participating in rituals and shamanic acts) informs the way people support themselves and interact with their surroundings (ibid.).

The *corpus* is transmitted via language from generation to generation, and typically in an oral fashion so that it puts great emphasis on memory (ibid.). The *corpus* is contained in an individual's mind and is the result of the synthesis of at least four sources. These sources include the experiences transmitted throughout generations over time, the experiences shared by one generation, the experiences shared within a household (or domestic group), and the experiences that an individual has based on

annual cycles (ibid.).

Toledo's *praxis - kosmos - corpus* complex represents a people's intellectual and material interactions with their environment (ibid.: 519). This process is expressed through the landscape (through natural memory) and in the minds of the producers (through human memory). Therefore the ethnoecologist seeks an understanding of this complex and compares it with his or her own perspective. In order to attain this goal, Toledo recommends that the researcher covers a set of well-defined procedures, such as recording structural, relational, dynamic, and utilitarian forms of knowledge (ibid.).

Although he suggests that his proposal for unifying ethnoecology can be applied to the Western, or non-indigenous world, Toledo makes generalizations about indigenous knowledge that differentiates it from all other types of knowledge (ibid.). Arun Agrawal argues that the dichotomy of indigenous and scientific knowledge is problematic (1995). Agrawal believes that it makes more sense to discuss types of knowledge with differing logics and epistemologies (ibid: 433). According to this perspective, the same knowledge system can be classified differently depending on the purpose for which it is being studied, or the manner in which it is being generated.

Gary P. Nabhan also criticises the assumption that there is a uniform body of indigenous knowledge (1995: 91). He says that there is a common misconception that all Native Americans use their surroundings in the same way, regardless of whether people think that Native Americans have been environmental stewards or not. Nabhan claims that, "[t]his assumption is both erroneous and counterproductive in that it undermines any respect for cultural diversity. It does not grant cultures – indigenous or otherwise – the capacity to evolve, to diverge from one another, to learn about their local environments

through time" (ibid.). In other words, many people have ignored the diversity amongst Native Americans by essentialising their philosophies and lifeways as a single thing.

With the perspective that Wixárika lifeways and philosophies are salient, and do not speak for a single Native American way of thought, I will rely on Toledo's model for ethnoecological studies as an intellectual framework in my analysis of Wixárika management of amaranth. First of all, I will provide a general overview of Wixárika agricultural practices. Then, by specifically looking at the *praxis* of Wixárika relationships with amaranth, I will discuss how Wixáritari manage different forms of amaranth as important resources. Chapter 2 will then explore how Wixáritari use wild amaranth greens as a famine food.

Chapter 3 examines Wixárika *kosmos*, or religion, and more specifically their various beliefs regarding amaranth. Teachers describe the ceremonial uses of amaranth seed, and situate this discussion in the context of oral traditions that describe the origins of amaranth. The *corpus*, or Wixárika knowledge about amaranth will be taken up in Chapter 4, and more specifically, the chapter will explore Wixárika linguistic classification of amaranth. Wixárika ethnobiology of amaranth will be presented and related to existing theoretical perspectives on ethnobiological classification. Chapter 5 will provide a summary of this work and discuss the significance of Wixárika ethnoecology of amaranths. I will conclude with recommendations for future research on this topic.

Methodology

My interest in Wixárika people began when I was eighteen years old, and living in the coastal village of San Blas, Nayarit, México. San Blas is located on the western

(coastal) edge of Wixárika territory, but more importantly it is a religiously significant area that includes an offshore rock spire and a cave on the nearby peninsula, Isla del Rey.² Wixáritari believe that this rock is *Tatéi Haramara*, the Goddess of the Pacific Ocean and that the cave is *Tutakáme*, the Death God and guardian of the underworld. This is also the location where the Sun Father dies each day and travels through the sea to the Land of the Dawn, which is also the place that Wixárika souls first travel to after death (Schaefer and Furst 1996a: 6).

Wixáritari have various oral traditions and beliefs regarding this site and San Blas is one geographical end of the many pilgrimages that Wixáritari make, with the other end being *Wirikúta*, birthplace of the Sun Father (located in the desert of San Luis Potosí). Wixáritari travel hundreds of miles to this sacred land of the peyote in order to partake in the deer/maize/peyote hunt. *Wirikúta* is also the location that the souls of the dead travel to after going to San Blas and briefly visiting their home communities (ibid). Although I have not yet seen Wixárika pilgrimages to the desert, I have observed people making offerings at the edge of the ocean in their colourful and distinct clothing. When one walks along the shore on Isla del Rey, s/he almost always sees melted candles, and the vivid gourds and figurines decorated with beads pressed into wax lying in the sand as offerings to Wixárika gods.

Eight years after my first experiences in San Blas, I traveled to the other side of the Wixárika communal lands, to see if I could find the plant amaranth being used. I went for a short trip to Huejuquilla el Alto, Jalisco in February, 2004, to visit the Huichol Center for Cultural Survival and Traditional Arts. The Director of the Huichol Center invited me to come and visit to see if I would be able to carry out my research during the upcoming

summer. This was my first time really interacting with Wixáritari and although many people told me that there was no amaranth there, others seemed willing to work with me and take me to where there was amaranth.

I returned to Jalisco in June and stayed through August of 2004, and although I do not speak Wixárika, I worked with various helpful and knowledgeable people in Spanish. Wixárika employees of the Huichol Center helped me with translations when necessary, and I was able to learn a basic vocabulary in Wixárika. I have translated any quotes or narratives from Spanish myself. Important Wixárika names of plants and religious figures are also provided throughout this thesis.

The specific research methods that I used include participant observation, informal interviews, voucher collection, and photographic documentation. Participant observation meant living with Wixárika people and participating in their daily activities surrounding the Huichol Center. This includes working in the communal gardens, where we planted and cleared plots, while chatting, eating and drinking together. I recorded Wixárika names of plants, landscape features, and practices. I did this mainly through participating in multiple informal interviews with four different people. Informal interviews involved my asking general questions regarding amaranth, and allowing the teacher to shape what they felt was important to talk about. We usually held interviews in fields or on the edges of garden plots where the different forms of amaranth were present, except when I worked with individuals weekly at the Huichol Center. Whenever I recorded a discussion, I paid the teacher an hourly rate that was already established by the Huichol Center and obtained and recorded oral informed consent, based on my ethics proposal approved by the University of Alberta.

I also learned from people while cooking and learning how to process the food parts of amaranth. People would share oral traditions, memories, and stories regarding the plant while grinding leaves to make tortillas, or weeding garden plots. Interestingly, whenever I asked about amaranth, individuals would begin by telling the oral tradition regarding Amaranth Boy, and how maize was acquired. People would give a general summary of the story, then refer me to a religious leader, or *mara'akame* for more details. I also used drawings, photographs, and herbarium samples as aids when asking about types and parts of amaranths.

Huichol Center for Cultural Survival and Traditional Arts

The Huichol Center for Cultural Survival and Traditional Arts has supported most anthropologists working amongst the Wixáritari in one form or another. The Huichol Center is directed by anthropologist Susana Eger Valadez, who was a graduate student in anthropology the 1970s. She went to the Wixárika homelands to do her fieldwork, got married, and decided to stay. The Huichol Center's original purpose was to provide alternative employment and resources for Wixáritari who were working in tobacco fields where they became ill from applying toxic pesticides. The Huichol Center supported bead and yarn-painting artists and the proceeds from the art went back into community-based programs.

Today, there are two different Huichol Centers that are still funded by employing local artists, and they provide community gardens, domesticated fowl, health care, lodging for *mara'akames*, and single mothers, and a kindergarten and after-school program for local children where the children learn about their traditions. The Huichol Center also houses the most complete library on Wixáritari that exists, along with

extensive ethnographic archives of interviews and artefacts that are a result of over thirty years of collection.

I chose to do my work in and around Huejuquilla el Alto because the Huichol Center offered me their support in exchange for doing work for them. The Huichol Center is in very good standing with the surrounding Wixárika communities, and so I was lucky to be able to say I was their friend, as people were more likely to trust me afterwards. As Valadez has been working in the area for thirty years, she also made it easier to explain to people what I was doing and why I was there, as people already understood her role. People were often very flattered by my interest in their way of life, and expressed that outsiders often like their culture, while local mestizos often do not.

While at the Huichol Center, I organized the library, translated and transcribed interviews, helped in the gardens and kitchen, and worked on grant searches and proposals. In exchange, the Huichol Center provided me with room and board, access to their resources and cultural specialists, and most importantly they provided me with introductions to teachers and nearby Wixárika communities. I was first invited to work with the yarn painter, Gonzalo Hernandez Carillo, once a week. He works with Valadez as an informant on a regular basis (as well as providing commissioned artwork for the Center's archives).

When I first arrived, I and the people that worked at the Center were shy, and it took about a month before we were comfortable spending spare time together and chatting casually. However, very early on, many of the women would tease me about dressing like they do. So I decided to buy the material and start sewing a *pañó*, or multi-purpose head scarf that Wixárika women wear and use to carry things (see Appendix A,

Figures 1.2 and 1.3). Once women saw that I could sew by hand, they were very impressed and started inviting me to visit and would joke with me. My sewing project grew into a much larger endeavour, as various women helped me sew an entire outfit that I later wore to the Sierra. By sitting and sewing, chatting, and tending the children on Sundays while the men played soccer, I was able to fit into a role as a proper young female.

By doing such daily tasks as working in the garden and sewing, I was participating in daily Wixárika tasks that a female of my age would do and so the Wixárika people that I knew became more accustomed to my presence. Although several people asked if I was married and why I did not have children by my age, I met a few other girls in Huejuquilla el Alto who were also my age and not married. During activities we were typically included with younger girls who were unmarried, but not always, as I had friends who were married that included me in their activities, such as working in the community gardens.

After spending time working collectively in the Center's gardens, I was able to meet various people who taught me about plant management. In particular, Imelda Cruz de la Rosa invited me to the Sierra, to work with her, and her father who is a *mara'akame*. We spent a short amount of time in the Wixárika village of Nueva Colonia, then about two weeks at their family ranch in Pedernales. I met some wonderful teachers and recorded the majority of the information that I used for this thesis at that time. I returned to Nueva Colonia two more times for short stays, as more people got used to me and invited me to their homes.

In Huejuquilla, I lodged in a compound that was also home to a family of six women, and the Huichol Center kindergarten. In the evenings I ate, chatted, did laundry, and watched *novelas* (Mexican soap operas) on the television with the family in the compound. On Sundays, which was our day off from the Center, we would go to the market, play games, and do chores. This particular family and I began to feel comfortable around one another and our relationships helped to make my fieldwork productive. After spending time in the Sierra, I would sometimes go down the road and stay with the family I traveled with, as I grew accustomed to staying in close quarters with them.

I had permission to collect and bring home herbarium samples from the Secretary of Agriculture in Guadalajara, whose staff were very helpful and aided me in recording exact locations of research sites. The agent with whom I worked also suggested that the specific wild type of amaranth that I collected, *Amaranthus hybridus*, was a subspecies that had yet to be documented. I had permission to do research in Mexico from the Mexican Consulate in Calgary, who issued me an appropriate research visa. Most importantly, though, I had permission from the people who taught me about their management of amaranth to write this thesis and use the information that they shared with me to further understanding of ethnoecology.

¹ Recent findings suggest that the C-4 ability is linked to elevation, with amaranths growing in lower elevations being C-3 plants (Hastorf 05/05: personal communication).

² Although Isla del Rey means, "King's Island" in English, the name actually refers to a peninsula.

CHAPTER 2: PRACTICE

In ethnoecological research Victor M. Toledo describes *praxis*, or practice as being the ecological exchanges that form most small-scale groups' way of securing nutrition (Toledo 2002). Wixáritari practice both shifting agriculture and gathering and hunting to ensure that their dietary needs are met. This chapter will begin by describing Wixárika general agricultural practices based on my own observations, which are supported by Phil C. Wiegand's 1972 detailed study of Wixárika co-operative labour groups in the community of San Sebastian Teponahuastlan. I will then discuss Wixárika management of *Amaranthus hypochondriacus*, which is the domesticated and prolific seed-producing form of amaranth that Wixárika people use (see Appendix A, Figures 1.1, 1.5, and 1.10). People cultivate the plant for its seed as a food source, but more importantly, they cultivate it to use in religious ceremonies. Finally, this chapter will explore Wixárika management of *Amaranthus hybridus*, a wild form of amaranth that grows in areas where there are disturbed soils (see Appendix A, Figure 1.6). Wixárika people use this plant as a famine food and as a seasonal famine food, and many people acknowledge its importance to their survival.

General Agriculture

Peter Furst speculates that the Wixárika style of shifting agriculture only slightly predates conquest, when Wixáritari settled in their present-day community lands (1968). Before practicing agriculture, Wixáritari hunted and gathered in the north-central deserts of San Luis Potosí and Zacatecas. As described in Chapter 1, the main crop in the Wixárika homelands is maize, which is planted by using a digging stick made from the quince tree (*Cydonia oblonga*). The steep slopes and lack of moisture in the Wixárika

Sierra permit only one crop per year, which they store in elevated granaries and eat during the dry season.

Cleared fields can be used for about four to five years before they need to be fallowed. People leave their fields in fallow for five or more years, and once they are re-cleared, the fields only yield worthwhile crops for three to four years before having to be returned to fallow. The best years of productivity for a field tend to be the second and third, while the first and final years have a lower yield. When new fields need to be cleared, the homestead leader (who is usually male) has to ensure that it is not going to cause conflict with neighbouring homesteads.

While all land in the Wixárika territory technically belongs to the community, certain use-rights must be respected. If people use land without permission, feuding can result; therefore leaders often engage in long negotiations to avoid conflicts. People hold meetings about clearing new fields at nearby, but neutral homesteads. Before leaders ask permission from others, they initially choose new field sites in passing, while doing other chores such as herding cattle or finding firewood. Then each household leader within the homesteads must agree with the site. Such agreement within a homestead is achieved casually, and usually in everyday conversations. Fields must be chosen and agreed upon in time for spring field clearing.

Clearing occurs March through May, by co-operative labour groups. Groups are especially needed for clearing new plots, as large trees require a lot of hard work to remove. Men perform the heavy labour in clearing the fields, while women and children remove smaller trees and weeds. Once men are finished clearing larger trees, including roots and scrub, they join the women and children to finish cleaning the rest of the plots.

People flatten or uproot grass and smaller weeds and then spread them over the soil, except for a border around the field. A border is left in order to ensure that the fire they will set to clear the debris from the field will not spread to the surrounding forests. People also set controlled fires to clear the old grass out of pasture areas.

The use-right holder of a particular field is in charge of setting the fire, even if an elder with more seniority is present in the clearing crew. These individuals also recruit their own co-operative labour groups. Yet if the household leader wishes to hire the main homestead leader, the household leader must casually approach the homestead leader and offer his clearing crew first as a gesture. The overall workforce depends on the size of the homestead in which the household belongs, and very little help from outside the residential unit is for recruited field-clearing. However, sometimes household leaders will pay those who help in heavy clearing activities in wages or corn. The leaders will also often provide beer and food for the workers.

The major homestead leader usually has his fields cleared first, then the eldest son's fields are tended to (Weigand 1972: 36). The household leader with the lowest status in the homestead has to wait for his family's fields to be cleared last, and therefore risks the chance that clearing will begin late and the rainy season will begin early, and his family's fields will be soaked before they can be burned. Because of this predicament, co-operative labour groups often consist of the major leader and his eldest son's workforces. The younger sons and sons-in-laws usually prefer to work alone with their families. However sometimes these smaller units will join together and work independently from the large clearing crew.

The need for large co-operative labour groups also depends on the amount of heavy growth in the field that is to be cleared. New plots and areas with more underbrush require more labour. An average household clears about twenty-five to thirty acres of land, but this size is growing. One individual, who lives in his community year-round, told me that those people who are working away from the communities are returning with more money, and therefore more supplies for clearing fields and fertilizing, so that they are not rotating land as frequently and are using larger and larger plots. He was concerned about this practice because it is causing the problems of land overuse and disputes over land-use rights. He predicted that in time, people will assert ownership over land rather than respecting community ownership.

One way that Wixáritari retain community solidarity in regard to their fields, is during the parching of the maize ceremony, which is part of the Wixárika ceremonial cycle (see Figure 2.1). The main goal of Wixárika ceremonial life is "to maintain ecological adaptation by pleasing ancestor-deities who are essentially nature personifications" (Fikes 1985: 117). Wixáritari believe that their ancestor-deities control all natural processes and the ancestor-deities must be honoured in order to secure subsistence and good health. During the parching of the maize ceremony, which is typically held in April, the male guests of the ceremony clear a portion of the host's fields. This is a symbolic act, as only a small token amount of land is cleared, and most guests are too intoxicated from drinking ceremonial corn-beer to participate in any heavy labour (Weigand 1972: 39).

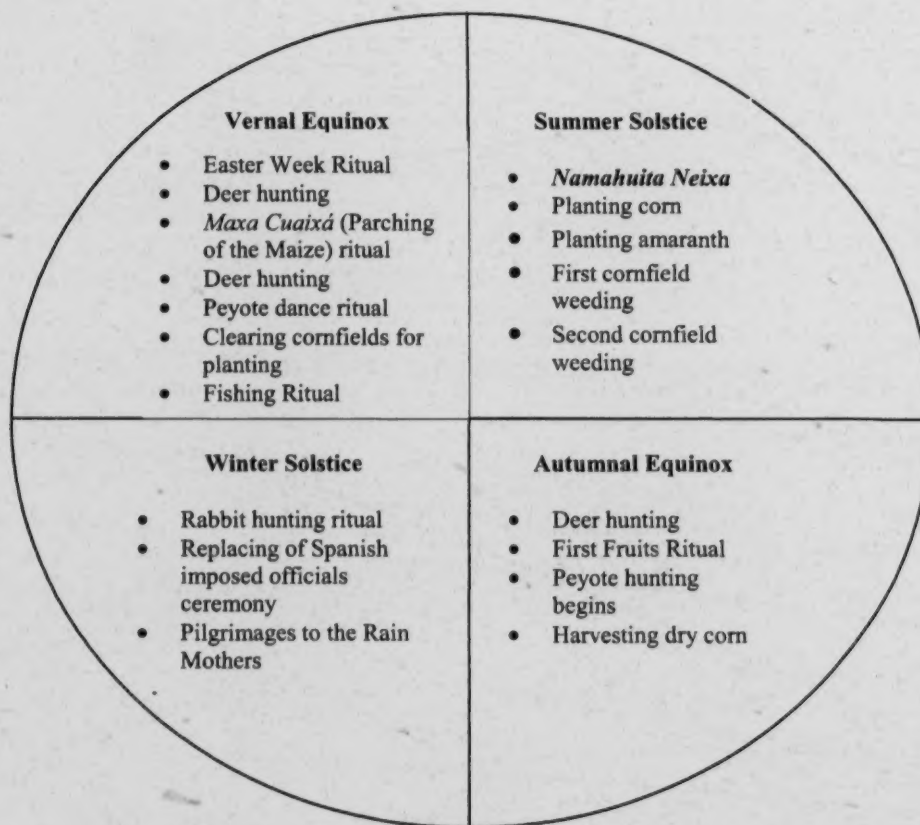


Figure 2.1: Wixárika ritual and subsistence activities. Adapted from Fikes (1985: 167)

Once the rainy season has commenced (usually in early June), people form labour groups again in order to plant crops. The household leader informally chooses groups, and then the groups offer their services to the appropriate homestead leader. Again, planting begins with the homestead leader's field, then proceeds to that of his eldest son. Often younger sons have to participate in more than one labour group, as they are required to help with their father's and father-in-law's fields. However, the eldest sons are rarely required to help in their father-in-law's fields.

Groups form for company, as well as for labour, as Wixáritari do not like to work alone. People joke and tell stories while working in the fields, and it is a time of light-heartedness. For example, Wiegand described some of the joking that occurs during sowing, regarding a sexual metaphor of using the digging stick to make holes in the soil (ibid.: 28). The jokes are told repeatedly and relate to the thrusting of the hard stick into the soft, warm, earth, which is impregnated by the seed. It was during sowing that I was first able to get to know people, as they were in high spirits and more likely to ask me questions about myself and work, and then in return share with me. My first invitation to the Sierra occurred while part of one such work group.

Wixáritari sow seeds based on each of the five different colours of maize that they recognize. The leader of the household provides the seeds to be sown. People favour the yellow and white seeds and so they plant about sixty per cent more of them. Then they plant the red, blue, and speckled seeds either in separate fields or in the remaining area left over from the yellow and white ones. Men, women, and children all participate equally in sowing activities and use digging sticks. People make new sticks each year by sharpening one end of a branch of a quince tree (*Cydonia oblonga*) about a meter and a half long. Once sowing is finished, people use the sticks for fire wood.

Maize (*Zea mays* ssp. *mays*), beans (*Phaseolus* spp.), and squash (*Cucurbita* spp.) are interspersed in the fields, along with other rarer crops, such as amaranth (*Amaranthus hypochondriacus*). Although Wixáritari acknowledge that there are five different types of all seeds, they do not separate all types of seeds according to colour like they do with the maize seeds. People carry enough seeds with them to plant each plot, and they carry them in bandanas that are sown together. Women typically wear these

bandanas, or *paños*, over their heads, or as *panchos*, and also use them to carry children (see Appendix A: Figures 1.2 and 1.3).

In previous decades, people also planted major cash crops such as peanuts, sugarcane, and cotton (Weigand 1972). However, such crops have decreased in value in recent times, and have consequently lost popularity. People grow other types of plants in household gardens, which are tended by household family members, and not by large work crews. Such garden plots require very little clearing because they are in areas that are well trampled from animal and human activity. People will burn the dried debris from their garden area, and they also deposit household garbage and human and dog, cow, and burro feces in garden plots for fertilizer.

People usually plant garden plots once the major crop fields are planted. Plants that are grown in these plots include gourds (*Lagenaria siceraria*), tobacco (*Nicotiana* spp.), chillies (*Capsicum annuum*), onions (*Allium*), tomatoes (*Lycopersicum*), watermelons (*Citrullus lanatus*), amaranth (*Amaranthus hypochondriacus*), cowpeas (*Vigna unguiculata*), and sorghum (*Sorghum bicolor*) (Bauml 1989). Seeds are started in small pots or buckets and then transplanted to the plots once they are large enough.

Dry season garden plots will often contain tobacco, tomatoes, and chillies as well. They are usually very small plots, or in small pots and flower boxes, as they need to be watered by hand. Both men and women will tend household garden plots, including the household leader. People will often also grow peyote (*Lophophora williamsii*) in small flower boxes surrounding their homes. These cacti are difficult to propagate, and rarely reproduce. *Peyoteros* (individuals who go on the peyote pilgrimage in the deserts of San

Luis Potosí) will usually bring back some plants or root pieces to be planted in their personal pots.

Once people have planted all of the various seeds and the seeds have sprouted and are growing, the plots need to be tended. When Wixárika people discuss the act of weeding their plots, they refer to it as "cleaning", or "*limpiando*" in Spanish. Two major cleanings are usually necessary, with the first usually a few weeks after plants have sprouted and the second is usually needed in August when plants are half grown. The household leader recruits smaller groups for cleaning than the sowing groups. Crops usually need tidying at a crucial time, so that is it best to disperse and clean individual plots rather than wait for large labour groups to clean leaders' and their sons' fields first.

During the first field-cleaning, some leaders will hire helpers and pay them with wages. These labourers are rarely immediate kin, and can include entire families. Cleaning plots is unspecialized labour, as men, women, children, employer and employee will participate. Most cleaning is done by hand, and many of the plants that people pull out are an undomesticated form of amaranth (*Amaranthus hybridus*), that people pick and collect as they clean so that they can take it home and eat it. Arbëreshë people (particularly elderly women) for example, living in Southern Italy, also gather greens, or young leaves during weeding in order to take them home and eat them, and this practice seems to be widespread amongst horticulturalists (Pieroni 2003: 70). Plants that are not kept to be eaten are either thrown between rows to dry out and be used as fertilizer, or those that are likely to re-root are thrown to the outside of fields.

The second cleaning of the fields is a less laborious task, as the crops are now larger and shade out competitors. Therefore, this time it is even more likely that the

household will not hire outside helpers. People clean garden plots at the same time as cleaning fields, but will also do so in passing. Plants that are in pots or boxes get cleaned out when someone notices that they need it. As the crops grow larger and edible portions form, people guard them from pests more attentively. If plots are extensively damaged, people will replant the affected areas. Some people protect their crops with pesticides; however, many of the pesticides used in Mexico are dangerous to people.

The Wixárika use of pesticides is documented regarding their working as labourers in tobaccos fields in the coastal areas near their territories. Wixárika, and other people, work seasonally in tobacco fields applying pesticides and then later harvesting the pesticide-coated plants, without proper protection or training in handling dangerous chemicals. Many of the pesticides used in Mexico are prohibited in the rest of North America, and include such chemicals as Aldicarb, 2,4-D, DDT, Azinophos-Methyl, Carbaryl, Diazinon, Paraquat, and Parathion and Methyl-Parathion (Schaefer and Furst 1996b: 515).

In her film, *Huicholes y Plaguicidas* (Huichols and Pesticides), Patricia Díaz Romo interviews the Medical Doctor, Ignacio Cano Hernández at his clinic in Sanitago Ixcuintla, Nayarit. He describes how in 1991 he and his staff treated 480 cases of organophosphate poisoning among tobacco workers, who where mainly Wixáritari (ibid.). Presumably, many of the same pesticides that people are using in the tobacco fields are also the same ones that they are applying on their plots at home.

However, one family that I worked with did not use any chemicals on their crops and the University of Chapingo, the foremost agricultural university in Mexico, has demonstrated recent interest in promoting permaculture programs in Wixárika homelands

with the support of Huichol Center. To protect against larger threats to food crops (such as deer), an individual, often an older male child, will stay over night in a field with a rifle, fire-crackers, or other loud objects. People will also make scarecrows to protect field crops. Dogs and daily activity usually keep pests out of nearby household garden plots.

Amaranthus hypochondriacus

Carl Lumholtz was the first ethnographer to discuss how Wixáritari use amaranth (1902). He recorded that he saw amaranth growing in the wild, and Wixárika people cultivating it (ibid.: 49). He identified the amaranth that he encountered as *Amaranthus leucocarpus*, which has yellow seeds. Lumholtz said that because the amaranth seeds are yellow, they are associated with the god of fire. He also noted that the seed was typically used for ceremonial purposes, unless maize supplies ran short and then people used it as a major staple (ibid.).

Later, in 1938, Robert Zingg discussed how Wixáritari drop amaranth seeds into their *milpas* (small crop fields/gardens) to have a convenient supply of the plants. He found that Wixáritari have two types of amaranth seed: a white, or tan coloured seed called *wawe* and a black variety known as *tau* (sun) *wawe* (Zingg 1938; 1977). According to Zingg, *tau wawe* is gathered during the dry season, and his colleague, Charles Wisdom, reported that *wawe* is gathered in October and November and stored so it can be eaten during the rainy season.

In the same report, Wisdom said that Wixáritari cut off amaranth flowers (*chual*, in Spanish) and then toss them onto a hide on the ground (ibid.). People winnow the seeds from the chaff by pouring them between baskets in the wind and then they store the

seeds in large gourds in storehouses. Wixáritari roast the seeds on a *comal* (type of griddle; see Appendix A, Figure 1.4), which causes the small, hard seeds to puff and turn white like popcorn. People then grind the popped seeds into a powder on a *metate* (grinding tablet). Wisdom also observed Wixárika people taking the flour and making a *pinole*, which is a mixture of water and ground maize and amaranth flour (ibid.).

People who taught me about amaranth seeds placed emphasis on its religious uses. One male *mara'akame* told me that amaranth seeds (from *A. hypochondriacus*) are only used for ceremonies any more. However, other female teachers told me that they still pop and grind the seeds to make drinks and tortillas with it. Some people stressed that they like the taste of it, while others said they used it for tortillas when they did not have enough maize, particularly in the late spring when the new maize is growing. In such times people use stored amaranth grains, however, and people usually sow amaranth around the same time as they do maize, so supplies of both plants can be scarce in the spring.

In places with deeper soil, people will make rows and plant the seeds under about 2-3 cm of soil. However, people more commonly sow their small fields in areas that are rocky, and they plant maize with digging sticks; planting each seed in a hole. Amaranth, however, can just be scattered over the rocks without burying it in the soil. Many people enjoyed talking about how you can simply scatter the amaranth seeds, and they will grow. This is related to the narrative about *Wawe Tamay*, or Amaranth Boy, who is the spirit of the amaranth seed and is very resilient. A version of the narrative about *Wawe Tamay* is given in full in the following chapter. Wixáritari acknowledge that they must maintain the domesticated forms of plants that they propagate, otherwise they will revert back to the

wild. They believe that the spirit of *Wawe Temay* will leave the plant if he is not cared for and respected.

As a part of the Wixárika ceremonial cycle (see Figure 2.1), certain people are given positions where they are required to grow and provide supplies for ceremonies for the five years. For example, an individual is required to grow amaranth for their local religious group so that everyone has enough during ceremonies. Those Wixáritari that live in the Sierra, and enjoy amaranth for personal use, also grow the plant in their maize plots. At the same time, people grow a special plot for their family temple where they will have maize, amaranth, and other religiously significant plants growing. However, many people lament that Wixáritari are losing the tradition of amaranth cultivation, and that some people chose to buy it for use in religious ceremonies instead of going to the trouble of planting and harvesting it on steep, rocky, and sometimes dangerous slopes.

Early on, Zingg recorded that Wixáritari use amaranth seeds to make animal effigies for religious ceremonies, but he was uncertain as to whether the effigies were in the shape of a rooster, deer, or turkey (1977: 660). Lumholtz had earlier described the use of such effigies in a ceremony that he referred to as, "*tamales de maiz crudo*," (the ceremony of raw maize tamales) (Lumholtz 1902). Lumholtz admitted that he did not understand this ceremony, but he described people making amaranth effigies in the shapes of deer heads (1902: 40). Zingg claimed that the ceremony that Lumholtz was describing was actually that of the First Temple, but the effigies that Zingg was aware of from recording the "Myth of the Huichol Temple" were in the shape of a rooster (1938: 659). Yet Zingg admitted that his informant had never actually seen the ceremony and

therefore the depiction of a rooster could have been wrong, and possibly a turkey was a more accurate description (ibid.: 660).

Regardless of the differences in the two authors' descriptions of the effigy, they both described the First Temple ceremony as involving a dance that Wixáritari perform in adoration of the sun (ibid.). During this time, the amaranth effigy is placed at the base of a pole that has ropes tied to it. Men dressed in women's clothing hold onto the ropes and dance around the pole (1902: 46). Later, the effigy is taken away from the temple to a stone and the worshipers circle around it. Those people that trip and fall from walking in the dark are thought to be at risk of getting smallpox and dying. The effigy is then brought to the temple and people break it up and eat the pieces (ibid.).

Lumholtz also observed amaranth dough effigies that were shaped like deer, turkeys, and rabbits during a ceremonial race with separate groups of young men and women (ibid.: 48). The runners race to a *mara'akame's* plume in a tree and as they return, each of the runners pierce an effigy with a piece of straw and deliver it to one of the distinguished men to eat (ibid.: 49). Women spray the runners with water upon their return, and no one is allowed to eat the effigies until all of the runners have returned. Other variations of this race involve women rolling amaranth dough into balls that the racers pierce once everyone has found two of the *mara'akame's* feathers (ibid.: 50). The racers that return with feathers receive gender specific gifts from the *mara'akames* (ibid.).

The early ethnographer, Konrad Theodor Preuss, who was in Nayarit from 1905 – 1907, also provided a description of the ceremonial use of amaranth. Pruess described how Wixáritari spear baked amaranth breads with blue cuckoo feathers and deer tails

(Preuss 1996). Participants race for the feathers and deer tails and then they eat the amaranth breads, which are called *kakái* (sandals). Another version that Lumholtz described involves amaranth cake animals being left in the ashes of the temple fire for five days, after which each of the *mara'akames* men eats them (ibid.). These cakes are often burnt and this is blamed on the greediness of the people of the underworld.

Today, Wixárika people still practice ceremonies using amaranth dough. One man told me that the races described above are practiced during the Peyote Celebration. This celebration sends off *peyoteros* (peyote pilgrims) on their trek to the deserts of San Luis Potosí. He also described how the pilgrims are required to fast for five days, eating only amaranth. Amaranth keeps the pilgrims from getting hungry and tired and protects them from spiritual dangers. The amaranth spirit, or Wawe Temay protects and guides the pilgrims as they eat it on their journey and it gives them strength and knowledge. They carry the amaranth grain in powdered form and mix it with a little sugar, water, and mashed up dried tortillas to form a sweet, and nutty tasting paste not unlike peanut butter. In recounting her experiences during a peyote pilgrimage, Barbara Myerhoff describes this paste as, "the sacred food of the First People" (Myerhoff 1974).

One of my teachers in Huejuquilla el Alto also talked about how amaranth grain was used a lot in the past, and how everyone used to plant it, and husbands used to give it to their in-laws as a gift. The husband would give the seeds to his wife's family to help support them, and they would take it to their altar and show it respect, ask permission to eat it, and then would consume it. Many people refer to amaranth seeds as a famine food, or as something they use to make tortillas when there is not enough maize. More commonly, however, people talk about eating wild amaranth leaves in times of famine,

especially as a seasonal famine food, when the rains come and the leaves are young, tender, and abundant.

Amaranthus hybridus

Amaranthus hybridus grows readily throughout Central America and into the northern parts of South America. The plant has large, broad leaves and grows to be over a meter tall in areas where the topsoil has been disturbed (see Appendix A, Figure 1.6). *A. hybridus* typically produces a small amount of tiny black seeds that Wixárika do not eat, probably because of the amount of labour required to winnow them outweighs the amount of nutrition one acquires in eating them. However, Wixáritari pick the leaves when they are young and tender, and these leaves are typically known throughout Mexico as a part of a group of edible wild leaf-plants, or greens known as *quelites*.

The young leaves of edible greens begin to grow with the onset of the rainy season in June. Robert A. Bye Jr. and Edelmira Linares (2000) discuss how the Tarahumara people (Uto-Aztecan speakers from south-western Chihuahua) use *quelites* as a food source. The authors employ an ethnoecological viewpoint to elaborate on six aspects that formulate "the general ecological principles of human exploitation of human vegetal resources" (ibid.: 197). The aspects are: importance of human disturbances, diversity of resources, measurements of productivity, ecological importance of plants in agricultural exploitation of vegetal resources, evolutionary significance in the domestication process, and the importance of these resources in the future (ibid.: 197-8). I will focus on the importance of human disturbances in regard to Wixárika ethnoecology.

In Wixárika territory, human disturbance includes cultivated fields, and the areas surrounding fields, living areas, and trail edges. People disturb the upper layer of soil in

such areas by digging, ploughing, and daily activities, and this disturbance is essential for amaranth seeds to germinate. Seeds that are near the surface of the soil sprout more quickly, as they are closer to light and warmth. The practice of allowing weed plants to grow in disturbed areas, rather than immediately removing them, especially from crop fields, is also beneficial and convenient for people, as they comprise a major food source while people are waiting for their crops to be ready for harvest (ibid.: 206).

As discussed earlier, Wixárika people participate in two major cleaning sessions of their plots, but not until the amaranth and other plants are large enough to pick and eat. Then they wait again, until there is opportunity to have a second amaranth crop before cleaning the fields. This practice ensures that there will be food available before the maize is ready to be harvested and eaten. Another possible reason for allowing the weedy plants, especially *Amaranthus hybridus* to grow amongst crop plots is that they can be hosts to insects that control corn-loving pests (Nabhan 1982). Amaranth greens constitute an important part of many people's diets, including the diets of Wixárika people, and especially during seasonal famines.

Paul Minnis describes famine foods as having to fulfill two minimal requirements (Minnis 2000). First of all, famine foods must be edible, and secondly, they need to be available when more commonly consumed foods are unavailable. Many famine foods barely meet the first requirement, as they often need extensive processing to make them edible. Meanwhile, the second requirement enables the individual to predict the types of resources that will be famine foods because of their place in the ecosystem (ibid.). For example, famine foods need to be those plants that have resistance to the factors that

inhibit success in typical food plants. Drought resistance is a significant trait for potential famine foods in the Wixárika context.

Low preference plants are used in a range of situations. For example, people consume certain plants during periods of seasonal hunger, while they may consume different plants during large-scale famines (ibid.). People may eat certain types of low preference foods only when other foods are unavailable, due to seasonal irregularities. Therefore, changes in available foods can affect local preference patterns. Minnis notes that with the introduction of new crop plants, the importance of certain native foods may change (ibid.).

For knowledge about famine foods to be passed on, other forms of learning may be necessary as opposed to simple observation, because famine foods are not necessarily used annually (ibid.: 232). Often oral traditions, myths, legends, and stories about past famines are particularly important in passing down knowledge about famine food plants to younger generations. Wixárika people, for example, often talk about how people used to eat *quelites* all of the time, especially before they acquired maize. Interestingly, young Wixárika children often comment on times when people had to go to the hills and eat amaranth greens, even though they have not had to do so themselves.

The time of the Cristeros (1926-1939) in particular, is one time Wixárika people talk about having had to eat wild plant foods. While demonstrating how to make tortillas with amaranth greens, an elderly woman told me about how when she was a child, federal forces came into Wixárika territory to find Cristero rebels and destroyed their homes. Many people had already fled their homes in fear of violence, and were living off wild plant foods that grew on the steep cliffs of the Chapalagana River. This was a time when

Wixáritari used amaranth greens as a major food source because *A. hybridus* readily grows along riverbanks and in disturbed areas. People conserve the amaranth by grinding the young leaves into tortilla dough (mixed with a little corn or any other available grain; see Appendix A, Figure 1.2), or they eat amaranth greens by boiling and then adding seasonings to them.

There are various subspecies of *A. hybridus* in the Wixárika Sierra that show differences in leaf pigmentation. People only pick the solid green leaves, and discard ones with purple or white spots on them. The solid green type are by far the most common growing in the rows of the *milpa*, and are less bitter in taste than other types. Wixárika preference for amaranth greens is variable; some people told me that they really loved the taste of amaranth greens, while others said that they only eat the leaves when they have to, such as during the rainy season when the maize is not yet ready for harvest. Even so, the gathering of amaranth greens and consequential cleaning of *milpas* is a pleasant occasion, as people joke, visit, sing, and give thanks to the Rain-Mother for helping all plants to grow, including those that need to be cleaned out of the *milpa*.

Discussion – Vegetation Management and its Relevance to Wixárika Practice

Janis B. Alcorn describes how North Americans and Western Europeans use the category of “weed” to refer to undesirable plants that grow voluntarily in domesticated field crops (Alcorn 1981). However, she makes the distinction between the plants that grow within a garden plot (domesticated and weed), and those that grow untended, or that are wild. Alcorn shows that these distinctions are not so clear in the tropics, especially in areas where people use shifting cultivation. Agriculture is only one of many forms of plant management, and domestication is only one of many outcomes that result from

plant manipulation (ibid.: 401). Furthermore, "[t]ypologies that focus on recognizably cultivated plants (designated by reference to domestication - e.g., semidomesticate - or to clear cultivation -e.g., semicultivated) in predefined spatial "structures" (milpa [small crop fields], garden, dooryard) have hampered our understanding of ethnobotanical interrelationships" (ibid.).

Alcorn's comments are based on work she has done in Mexico with the Huastec people of Veracruz and San Luis Potosí. Alcorn found that Huastecs do not consider the vegetation that grows in *milpas* to be weeds, but they recognize it as a resource that helps to protect against erosion and to replace nutrients in the soil (ibid.: 402). She asserts that vegetation that grows voluntarily, or spontaneously, "is not a passive backdrop against which human activities occur", and that Huastecs manage such resources as opposed to gathering them (ibid.).

Alcorn divides Huastec plant management into two forms of plant manipulation, which are manipulation en masse and as individuals (ibid.). This is because at the same time that a plant can be seen as being a part of undifferentiated vegetation, it can be seen as an individual plant contrasted next to surrounding vegetation. For example, when a person is cleaning the vegetation from an area, they may recognize an individual plant as a useful resource in a particularly convenient position, and therefore decide to spare the plant from cleaning. A person's decision to save a plant is based on the type of plant, the amount of the plant that is needed at that time, and the person's ideas about the plant. The person may also choose to simply clip the plant, allowing it to live, and perhaps even branch into an even more useful form.

When a plant resource is not readily available in a person's environment, they may decide to collect the seeds so they can be scattered in a new location, or the person may transplant the resource of interest (*ibid.*). Selection of plants to be moved is not necessarily based on artificial selection for particular desirable characteristics, as may be assumed. Instead, people alter the "spatial and genetic structure of...populations in a manner that artificially produces conditions for genetic drift or gene flow" (*ibid.*: 403).

Then, natural selection operates on the resulting populations (which may be already adapted to particular habitats where people are more likely to find them). Some species may be successful in certain areas because of their adaptation to disturbed areas (*ibid.*: 404). It is likely that in tropical areas, disturbed areas have helped to create a variety of secondary successional conditions, thereby influencing the evolution of such plants (Gómez-Pompa 1971 *cited in* Alcorn 1981: 404).

Meanwhile the shifting agricultural system utilizes the existing forest *en masse* for food production (*ibid.*: 408). As Alcorn explains:

The milpa system of shifting agriculture uses the forest *en masse* to produce food. The burned bodies of the slashed trees fertilize the soil, and the roots of the slashed vegetation hold the soil in place. Even while maize, beans, amaranth, and sesame are being planted, forest regeneration, and thus milpa resource regeneration, begins. Stump-sprouting trees and fast-growing herbs quickly cover the soil between the maize plants.

These noncrop plants are recognized as and manipulated *en masse* as a resource. If there is a drought, these plants will not be slashed back, but will be spared to shade the soil and maize plants and so lower evaporation and transpiration. If there is sufficient rain, however, they will be slashed back one month after planting in order to mulch the maize and give it a chance to rise above the noncrop canopy. After the harvest of the crops, the noncrop plants continue to grow and will in time be harvested, as it were, to fertilize another milpa and to provide firewood (*ibid.*).

Therefore, the Huastec, and Wixárika ways of managing plant life through shifting agriculture produces a more diverse vegetation than would have existed without human interference (ibid.: 410). This diversity of vegetation is available with a minimum labour investment (in comparison to crop propagation) and therefore decreases risk for agriculturalists.

Wixárika practices surrounding both *A. hypochondriacus* and *A. hybridus* demonstrate that Wixárika people manage plants in their environment in various ways. While *A. hypochondriacus* can be planted in rows in the *milpa*, it can also be scattered in rocky areas and left to grow. Although many people claim to no longer cultivate the plant as a food source, religious practices ensure that Wixárika people continue to use and consume the nutritionally significant plant. Wixáritari believe that they must continue caring for and cultivating the plant, otherwise it will revert back to the wild.

While Wixáritari consider *A. hybridus* to be a wild plant, they do not consider it to be useless, or a weed. They clean the plant from their *milpas*, and they save it and take it home to eat fresh, during times when they need to supplement diminished maize supplies. The young, tender, green leaves conveniently sprout up in disturbed areas, an ancient food source for Wixárika people, that has retreated to being a seasonal and extreme famine food. Older Wixáritari tell young people about having to eat the plant in times of crisis, and in doing so they pass on their knowledge about how to find and consume the plant in case of the re-occurrence of crisis in the Sierra. Oral traditions, or histories, also inform young and old Wixárika about why and how they should continue care for amaranth.

As Imelda Cruz de la Rosa stated,

We eat [*K'uxa* or *A. hybridus*] up there in the Sierra, or in the canyons, many people eat *quelites* [greens] in the canyon, right, because that's where the cows are, and the cows eat shrubs. Then the cows leave their manure, that's where the really beautiful *quelites* are born, and that's why we cut those ones, they are made very flavourful for us, that's why we cut them, but this isn't *wawe* [*A. hypochondriacus*], it's a different herb. When *wawe* is little, we can use it like *quelites*, and then later when it is big, we can cut its leaves, purely leaves, and we eat them, then we put it in hot water, and leave it for one hour. After an hour it is cooked, and then we put it in cold water in order to cool it off.

People used to eat these more before, they used to plant it a lot, before they had maize, before there wasn't much food nearby. Many people would go to cut the *quelites*, they used to pick the little leaves, and they used to bring many *quelites*, but they make these *quelites* raw, then later you mix them, and you grind them and it makes more food for the whole family. Then later you make tortillas and such, and you eat them like that. But now the people don't make them so much, they are leaving to work, but yes, we eat the *quelites* in tortillas, *wawe* too, *wawe* is better to make tortillas...*wawe* is good for many, many things, *wawe* is the companion of maize (personal communication: 22/07/04).

The following chapter will explore oral traditions and beliefs that support the continued Wixárika management of plants such as amaranth and maize.

CHAPTER 3: BELIEFS

Wixárika religious beliefs permeate their everyday lives, and one way that people share their religious knowledge is through the telling of oral traditions. Oral traditions often explain the creation of the world, humans, animals, and plants, and also provide rules for proper conduct. Proper conduct thereby ensures ecological order, as Wixáritari believe that the maintenance of religious rituals and traditions guarantee environmental balance. Toledo believes that indigenous cosmovisions, which applies to the *kosmos* part of his framework, inform people how to support themselves and interact with their surroundings (2002: 515).

By looking at several Wixárika oral traditions, one can see that their religion guides people on how to live what they often refer to as, "the good life". The following oral traditions focus mainly on the seed of the domesticated *Amaranthus hypochondriacus*, as this is the species that holds important religious significance. Wixárika believe that the seed needs to be tended, otherwise it will go back to the wild, and the spirit of Amaranth Boy may leave the plant. His spirit lives in the seed, and each time someone plants it, and it grows, Amaranth Boy is re-born.

Histories

Whenever I asked a Wixárika person about amaranth, they responded with a version of an *historia* (history, or narrative) about Amaranth Boy, and then upon prompting would talk about practices or naming regarding amaranth. The term, *historia*, loosely translates to *cahuito* in Wixárika, and refers to an oral tradition that people tell during rituals. Wixáritari tell histories often both during rituals and outside of formal

rituals, and they serve as a way of teaching, reinforcing, and agreeing upon what it means to be Wixárika.

In this chapter I include narratives about Amaranth Boy from three key consultants. Each individual told me a slightly different version of the Amaranth Boy history, just as each published version of the history differs slightly (I provide one version of the Amaranth Boy history in this chapter). Variability is an integral aspect of living oral traditions, as each telling, or performance, relates to the speaker, audience, and context of the narrative. Julie Cruikshank discusses such differences in the context of Yukon narratives by stating, "...different narrators tell stories differently, and it is important to stress that no version is "better," "worse," more or less "correct" than another: the differences reflect individual talents and interests of different storytellers" (1990:19).

The listener also affects how the teller shapes the stories that they are telling. People relayed histories to me in Spanish, often explained geographic locations, translated Wixárika names, and most noticeably highlighted and perhaps sometimes added details about amaranth. Each of these factors surely affected the history that each individual told to me, as opposed say, to a grandchild. As Greg Sarris describes in his work on Native American texts, people use oral traditions in various different ways in order to serve many different purposes (1993: 4). For example, stories often serve as cultural indexes to demonstrate appropriate and inappropriate behaviour. Stories "...work to oppress or to liberate, to confuse or to enlighten" and the nature of the story depends on the characteristics of both the speaker and listener, along with the specific circumstances at the time of the exchange (ibid.).

I elicited narratives by asking people to talk about amaranth, and I often tape-recorded the histories that people told me. I asked few questions, out of respect for the speaker, as to avoid interruption. One point that needed clarification is that people use the names *Watakame* (The Clearer of the Fields) and *Wawe Temay* (Amaranth Boy) interchangeably. People told me that this is because he is the same person. In the histories below, I use the name that the speaker used. These histories are a sample of different accounts that people shared with me about amaranth. I use speakers' Spanish names (rather than their Wixárika names) to identify them, because these are the names they used around me in everyday life, presumably because we communicated in Spanish. The narratives that follow are organized by the speaker. I begin each section by introducing the speaker and the context of the narrative, followed by English translations of the histories. I conclude by comparing the narratives I recorded with some published versions of related histories, and then discuss their interpretation and significance.

Gonzalo Hernandez Carillo

Gonzalo Hernandez Carillo is a yarn painter who lives in Huejuquilla el Alto with his children. The Huichol Centre commissions Gonzalo to make paintings for their ethnographic collections (see Appendix A, Figure 1.7), and to participate in ethnographic interviews once a week regarding Wixárika religion. Gonzalo taught me about amaranth on various occasions, at the Huichol Centre, and in their gardens and community *milpas* (small crop fields/gardens). Although he is not a *mara'akame*, Gonzalo learns about Wixárika histories, as they influence his paintings and he actively teaches Wixárika traditions to his children. Orphaned at a young age, Gonzalo moved to Mexico City where he sold beadwork in the streets. He gained enough money to become self-

sufficient, began to make yarn paintings, and decided to move back to the Sierra in order to learn Wixárika traditions.

"We Are a Flower Petal"

Many Wixárika people ask me, why do you know so much, yes, because I'm Wixárika [laughs] because I'm Wixárika, yes, I am Wixárika I always say. So if I'm not anyone's informant, I'm not anyone's intermediary, it's no, that I want to know directly what I want to know. I'm not going to ask of my friend, "Listen, teach me what you know", it's mainly not right, you don't know more than me, so I have to start to search. So what it was like, how were you, like that again from my dreams, again from my ideas, things originate in the head. So I continue on, I continue on, in order to make a large panorama. Between everyone we are a universe, we are a petal flower, with each, each petal that is falling, it gives us humanity, but the plant continues, continues living, the plant never dies but the flowers fall. It is just as we need, it is as if you had a family, if you had a papa who died on you, but does not die, does not die. It just occurs to you and as well as we came, nobody knows where we came from but we arrived, and so we occur, you are the same one, you are the same one there, you do not die, but you are the same one, your family continues living. You leave your family and there they continue living, it is a plant that never dies, that is history, of which I know (11/06/04).

Calloused Hands

Wawe Tamay, is the amaranth character, and they used amaranth when he got married. There was a competition, so that he could show that he knew how to work, or rather that he had hands that were calloused. So there were like some ten, ten young ones and he that had calloused hands, he got to be, he's going to be given my daughter. But there was another type, there was another person that was really mischievous, he was, he was I don't know, what he was called, and he was the most mischievous. So he was asking himself, "Well, what can I do?" There was another person, there was the wise one and the mischievous one asked him, "What can I do in order to, it's that I like this woman, and I want to marry her, but I don't know, I don't like to work, I don't have calloused hands." "Look," his counsellor said, "look you know what, you can put the amaranth on your hands, so that you can paint your hands so they look calloused." So he covered his hands in amaranth, and it started to dry, when he started to paint his hands, it was like he was the best worker [laughs] so he was going to get married with this person. No, so *Watakame* stayed because he was good for the woman (11/06/04).

The History of Amaranth

The woman was the deer and the man was *Watakame*, he was the deer, or rather they weren't the normal type, they were in the time of the gods. So for the Wixárika the deer means a pair from there. There existed the gourd, which for us, is sacred and the arrow is sacred for us. So it meant that the man was the arrow and the woman was the gourd. That's where it all started, the first myth was that

the maize followed the amaranth, the amaranth is both, is both women and men, or rather they come from the same, the same mother.

It is because of this that now we practice, when there is the ceremony of Real de Catorce, one always takes his or her amaranth in powdered form. This is because we are fasting for five days and you can't eat tortillas, or water, so you can survive on amaranth. You put honey and mix it, and you go eating it, and you go sustaining yourself with him, the Amaranth Boy, and you go, you go, you go going, and you go learning about the culture, the traditions like how the amaranth can serve you, because it is nutritious, because you sustain yourself with it. It is a history, one that is, but first there is maize, they are similar, it is symbolic, so, for us, it is called *Wawe Temay*.

It's symbolic, so for us it's called this, it's what one already started, we use it and then already it's passed. They were for the gods, it wasn't a distance, the gods were looking for a place in order to be adequate, the place was hidden. It was because the women were in the sea, for the women pertain to the sea, it's of water. But the men, are from Real de Catorce in the region of *Wirikúta*. This is the history that formed, because always when there is a fast, always each *peyotero* uses his or her cup of amaranth, but always powered, already made.

Amaranth is used in the rituals of the pilgrimage of Real de Catorce. Look, when you are in the fast, it serves as nutrition of the spirit, amaranth is going to provide

you with nutrition, which is *wawe*. This is the tradition that may be, that we have only conserved a little bit, but now hardly at all, and we never know why, why we are using it. It interests many because we consume it, but it's not only that we go to restore ourselves, it's more than you simply consuming the amaranth, you're not going to sustain yourself until the break in the afternoon that way.

We form a circle and each person puts amaranth in their gourds, and from there they form, each person has to make it, in all, in all of their gourds. We do it like that in order to sustain ourselves and already we have all made everything in each gourd, and we offer it to the fire, that we call *Tatewari* [Grandfather Fire]. We ask for pardon from the Grandfather Fire, the Grandfather Fire, whether we do well, or don't do well, so that he guides us, so that he cares for us, so that nothing bad happens to us on the way, we ask for pardon, we pray. In each part is always a ceremony, always there is a ceremony, this is the history of amaranth.

I don't know the histories very well, it's very, it's very sacred for us, but if we don't get accustomed, if we don't accustom ourselves to harvesting, but if we have myths, if we have this history, we have a history about ourselves, of where we come from. In the place where we come from, that plants come from, or rather, we come from the same plant as maize, amaranth, squash, and the other plants that we recognise, we come from there, we gather from there. Because of this we culturally know that which is our tradition, we adore making fiestas. In each ceremony the women always use maize, in each ceremony, we [men] don't

belong so much to the maize, the women are more in charge of maize, and because of this we call it *Niwétsika* [young maize goddess], that which, it's that which lulls the maize.

They come from there, amaranth comes from there, this is the history of the amaranth and the maize. This is of *Tatéi*, our mother of the maize who is called *Haramára* [Pacific Ocean], the blue water, this means the blue water, *Haramára*. *Wawe Temay* is the character of amaranth, we always adore amaranth when we have a ceremony, when there is a renewal of the alter, we always use amaranth, and there are other times, like when we have the dance of the peyote. All of our histories come from there, they come from the sea, amaranth comes from the sea, maize comes from the sea, the deer was made, the foam turned into the deer, the foam turned into the clouds, the clouds turned into, no they burst, and we converted ourselves from animals, this is the Huichol history (05/07/04).

Ceremonies

One uses it [amaranth] in different ways. Every community uses it differently, it's not always the same. In Santa Catarina they use it in different ways, in San Andrés they use it in different ways, but the symbol is the same. It's no more than different customs. In Santa Catarina when they bring down the roof of the ceremonial centre, the big house, that is *Kaliway* [Nahuatl word for temple, Wixárika people use this word while speaking Spanish], they take away the roof, when they remove it, the women make little balls, they make little balls of

amaranth. We call this plant, we recognise this plant as *xapa* [*Agave guadalajarana* Trel.], but there are few of these plants, but in San Andrés they know it as *Wicholate*, this is the significance of the plant, *xapa*, this means the fruits of the plants.

So when they roof all of the big house of the major temple, the women start to winnow everything into each ball. There are about thirty, forty women, first in the afternoon they put each gourd in each of the altars in the ceremonial centre, it depends on which group each one comes from, because there are five altars in Las Latas, and there each woman takes her gourd where it belongs. So they circle around the inside of *Kaliway*, then they throw balls in each of the four cardinal directions. They throw three in the direction of San Blas, they throw four in the direction of *Wirikúta*, of Real de Catorce, at the fourth round that they make, they throw five balls into the centre, so it's that they first start with one, and go throwing two, and so on, until they arrive at five, so they make five turns. These are called the *xapa* fruits, when the fruits fall from the plants, this is the significance of the amaranth, when we do renovations on the major temple, that's called *Kaliway*, this is the other meaning.

During the time of *Pachita*, those from San Andrés make little balls and string them around a cord, but with little balls wrapped in corn leaves. So they tie them up and they go hanging them, they go hanging them, they make it into a necklace, they make it into a necklace, then they put them in the temple of San Andrés, all

of them. This is made by the authorities, we say, and these traditions in the temple of *Pachita* last three days. Before that, when the *Pachita* has finished, all of the people responsible for amaranth, they no more than give it, they make gifts for everyone, everyone is invited, everyone goes to see the temple of *Pachita*, at the finish, this is another use of amaranth, that is tradition (05/07/04).

Imelda Cruz de la Rosa

On July 1st 2004, I was with a large group of Wixáritari who work for the Huichol Center while we cleaned a *milpa*, pulling out young green plants (or *quelites*), and sorting wild amaranth leaves into bags. Imelda told me that she loved to eat amaranth leaves, so she was taking a lot home, and that she was unusual, because she liked them so much. She told me about her father, Agustín, who lives up high in the Sierra and is a *mara'akame* who is very knowledgeable about plants and often grows amaranth in his *milpa*. She told me that she was leaving to visit him in a few weeks and I was welcome to come with her (see Appendix A, Figure 1.8).

This was the beginning of an important friendship, and Imelda introduced me to many Wixárika people and traditions. She often claimed that she knew little about traditions and histories, and would refer me to her father with my questions. However, in listening to our recorded conversations, I realized that the concepts that Imelda taught me about are some of the most insightful. Imelda was my most important teacher regarding knowledge and linguistic classification (discussed in Chapter 4), and also shared important information about *quelites* (see Chapter 2).

Imelda's narratives were not formal narratives about Amaranth Boy, but described the use of amaranth in religious ceremonies. Imelda said:

In the time of fiesta, we toast amaranth seeds on the *comal* [traditional griddle] and then later we grind it. We grind it and then make it into little balls to wrap in leaves. This is for during the ceremonies. The little balls are the necklace of Jesus Christ, because the *mara 'akames* make them into a necklace. Later, they make it longer for all of the people. Other times we use it in our temple. When we finish the house, we make it higher, we put them up, and then later we take them down and eat them. When we make them, we put sugar in them, they are sweet and very tasty. They are very sticky, and later when we make the little balls we make them very sticky and very sweet and very good, and then we make the necklace. We use them for many things. Sometimes we just make little balls and give them to the children because many people say they have vitamins. In *Kaliway*, they make the little amaranth balls. They give them to the people, they prick them. Well, they make a gourd and many people go and they prick them with a feather and they give them to others (22/07/04).

On the day that Imelda first invited me to the Sierra, the other women working in the *milpa* taught me about *quelites*, but they also laughed and joked and taught me about the joy of their gods and goddesses. Some rain clouds started coming while we were working, and several ladies jumped up and were very happy. They said that *Tatéi Haramára*, (Our Mother the Pacific Ocean), was coming to help the maize that we were

about to plant to grow. They also told me that *Tatéi* is the earth, and that it is their mother because they come from it and go back to it.

Augustín Cruz García

Imelda took me to her home community in the Sierra, Pedernales, to meet her father, Augustín. Augustín is a *mara'akame* who lives in a compound with his wife, granddaughter, and father, who is also a *mara'akame* (see Appendix A, Figure 1.9). Imelda and her family have a compound next to that of her parents, which is where we stayed while in the Sierra. Pedernales is a day hike from the Wixárika village of Nueva Colonia, and we stayed there for two weeks. Imelda's family was welcoming, and her father has a penchant for plants, so my experience in Pedernales was very rewarding.

Augustín agreed to work with me formally, and told me to come to his compound in about an hour so he could get ready. He emerged dressed in a colourfully embroidered suit that his wife had made for him along with ceremonial hat and items (see Appendix A, Figure 1.9). He then led me into a room where he performed a short ceremony and burned copal (a tree resin used as incense, likely *Bursera* spp. (Case et.al. 2003)) and consumed peyote. He told me to turn on my tape recorder, shared the following history with me, and then told me to turn off the recorder. I asked if I could ask questions, he said yes. I asked one question, then he told me to turn the recorder off again, which I did.

Amaranth Boy Finds Maize Girls

First of all, amaranth was used in the times of the gods. The first man who was called *Watakame* was born in the place where San Blas is now, the place of the sea, he farmed and worked there in the countryside. He met people who used and ate maize, but *Watakame* never, never, never found out what maize was. He lived

with his mother, who was called, *Tatikwimuka*, she was the mother, our mother of the rain. One day she asked where they would get the maize, those who eat, those who toasted it during the afternoon, the evenings. Always they would hear the thunder of the maize when they would toast it. So, one day it occurred to the mother, listen, why don't you ask them, the young ones who toast the maize, where they take it, go there to buy it from them.

So the boy went to them to ask them and they said to him, "No, we are going, going very far, but if you want to go with us there, way, way over there, you can." So, one day he went with them and half way there they stopped and made camp. Then later they went to bed and when *Watakame* awoke, the boy had all of his hair cut short, they had left it cut, and they cut his eyelashes and he couldn't see. Then over there he started, he started to see a little by little, and then later he started to see a dove nearby [*kukuru*, the mother of maize's animal form]. A dove, and he told it, "Look you know that they abandoned me and if you were a person you could tell me where they sell maize". So when he started to, started to see this animal he always had his arrow, his arrow and bow. Then he rose and shot at it and it went, it flew, and he started to see the animal when, when the arrow was falling and then he started to distinguish some houses. "Ahhhhh so over there are some houses I am going to go down over there to those houses."

So he went down and arrived in this place where there was an elderly woman that was sixty or seventy years old. He said to her, "Good afternoon", and she said,

"Good afternoon, what have you to come to do in Nueva Colonia?". "No, I'm lost, it's that I came with some, with some companions who abandoned me in the night over there. I come from over there to see where people sell maize, but I don't know where they sell maize, could you tell me where?" She told him, "Ahhh maize, who knows, it's just that we don't know, no, for they told me they fooled you, they are, they have characters of tricksters.¹ Those people came to rob me of my maize, they didn't come to me to buy it. I know that they burn it with matches, I know that they burn it with, with embers and for this they told you, they fooled you, they didn't come to buy things, they came to rob me of what I have. No, so, I don't know."

There were five young girls and the eldest of the sisters was named *Yuawima* [blue maize goddess], the next was *Tsinawime* [mottled-colour maize goddess], the next was *Ta+rawime* [red maize goddess], the next *Taxawime* [yellow maize goddess], and the next was *Tuxame* [white maize goddess]. They were the names of five, five girls that were there. And the mother said to *Watakame*, "I'm going to ask the girls to see if any of them want to go with you". And he sat there thinking, the boy sat there thinking and said, "No, but, I didn't come to ask for girls, I came to buy maize." He said, "No but I wasn't told to bring back a girl". But the woman, the mother of the girls, she captured the thought of the boy and went and brought five, she brought him five tortillas of different colours, and she gave him a little cup of beans, and well, offered him them. "Listen you can eat them,

although there isn't much". And the boy said, thought, but never said aloud, he only felt, "No, I won't fill up with these tortillas, I'm so hungry".

He started to eat and eat and eat and they produced, the tortillas produced themselves, they never came close to finishing or he never finished the tortillas and he said, "I'm full and all are still here, I don't know, I'm eating ." And the woman returned: "Have you eaten?" and he responded, "I'm already full and I couldn't finish". The woman responded, "Already? No, you're going to fill up, we are going to fill you up with these tortillas." She thought it but she didn't say it aloud. So she divined everything, and after eating, she said so.

There were other women, there were other women, there was woman, woman of squash, there was woman of amaranth, there was woman of bean, and there where other types of plants. So, there where many woman but they were of different, different plants, of amaranth, bean, of squash, of all types. So when he went to take their sister, all said, "No I'm going to go with my sister". "Me too, I'm going with my sister." And the amaranth said, "Well, no, well, I'm not going". And her mom said, "No, you girls aren't all going to go, because no, because they are going to scatter you, they're not going to keep you together, they're going to throw you about, they will have you scattered, you will, you will be scattered there, don't go there".

But still they went because the sisters went, and well, there the mother made it known, she made it known to the boy, she told him, "Look, you know you are not going to take my daughter yet, you have to make five houses upon arrival". Five houses, they were, they weren't houses they were like altars, they were like alters of a hermit and no well, he went and began to make his houses. The mother told him that after five days he would have to be in his house, and at the sunrise he would look, and he would have to look in each house. So, five days passed and on the fifth day, he rose, and started to look. In each house there was colours, ahhh, colours of maize, and each house, in each altar, there was, there was the girl, but not only did she arrive and appear it was like a miracle all that appeared and there was all that lived. There were all of the plants. // *Wawe Temay* lives in *wawe* and is born every time a seed grows (20/07/04).

Previously Recorded Histories

In her book, "To Think With a Good Heart: Wixárika Women, Weavers and Shamans", Stacey B. Schaefer provides a collection of the different Wixárika maize acquisition histories that she recorded (2002: 197). I will look at a few passages that are different from the versions that people shared with me, but relevant to histories of amaranth. In the "Story of Niwetsika", the boy named *Wawe*, or *Wawe Temay*, found his maize wife, *Niwetsika*, and took her home (ibid.: 198). His mother-in-law warned *Wawe Temay* not to ask his wife to make tortillas, because she is made from the same thing, maize, and to grind maize for tortillas, would be to grind herself.

However, when *Wawe Temay* went out to the field to work, his mother came by and scolded the young maize wife for not working as a wife should. The bride did as she was told, and ground maize. As a result, she started to bleed, and the *milpa* started to bleed. *Wawe Temay* rushed home to see what was the matter, only to find that his wife had already left, and returned to her mother. "That's why he went to Niwetsika's house looking for her. Tatutsi [Wawe Temay's mother] was angry with Wawe for not taking proper care of her daughter. Wawe went into the house to see Niwetsika. She was swollen all over and when he shook her hand he held only white powder in the palms of his hands" (ibid.: 198-199).

Shortly thereafter, *Niwetsika* disappeared and in the history of "Nitwesika in Wirikúta", Schaefer summarizes how *Takutsi* and *Wawe Temay* go to find *Niwetsika*. After a journey through the canons where the pilgrims go fishing and deer hunting for the first time, they end up in *Wirikúta*.

Upon arriving in Wirikúta, Wawe found only peyote. When Niwetsika lived with him, there had been maize. There had been tortillas of many flavors. When he found her in Wirikuta, she tasted very bitter. That's why she turned into peyote. All of the territory in Wirikuta was filled with the power of Niwetsika, of peyote. Niwetsika told Wawe that he had to make an arrow. She told everyone they must look for peyote. They concentrated all of their powers to find maize. They did not give up hope and went deer hunting. In the deer they found something beautiful that they did not know before. Niwetsika was hidden inside of the deer. She had come along with the pilgrims without them ever knowing. (Schaefer 2002: 199)

Now that the pilgrims had found *Niwetsika*, they rested and ate the food that she provided, and made offerings. Then they all concentrated and each of the five colours of maize appeared. "That's how it happened. Now we must have maize, but Niwetsika stayed in Wirikuta. Although we do not see her from far away, her spirit is always with

us. That's how Wawe discovered maize. Now we conserve her. We call her "my seed" and do not want to loose her." (ibid.: 200).

The early ethnographer, Theodor Konrad Pruess, recorded a description of the same history in the early 1900s, which he called, "The Marriage of Maize" (1996: 101).

The following passage about *Takutsi* offering *Wawe Temay* her maize daughters is germane to the discussion of amaranth:

She [Takutsi] opened (the door and called out): "Come, yellow maize; red maize, come; black maize, come; multicolored maize, come; white maize, come; squash flower; come, *uaute* (amaranth). You go (with him), yellow maize." "No." "Red maize, you go." "No." "Black maize, you go." "I won't go."

"Multi-colored maize, you go." "I do not go. Tomorrow or the day after he scolds me. I go very slowly." "Squash flower you go." "No. One cuts me with the knife." "Red *uaute* (amaranth) you go." "No, one throws me away." "White maize, you go." "Yes I go." (Pruess 1996: 101).

Pruess later explains that red amaranth did not want to go with *Wawe Temay* because its seeds are so small, many get dropped and lost during harvesting. This is why she claims that people throw her away (ibid.).

Jay Courtney Fikes also provides a version of this key *Wixárika* history which he called, "How Maize Was Acquired" (1985: 291). The version he provides is very similar to the one that Augustín shared with me, except for when *Watakame* arrived at *Takutsi*'s house, she told her daughters to come because their brother had arrived. All of the girls giggled at this because he was so wild, or unkempt. Also different in the version that Fikes recorded was that, "[t]he only one interested in going with him [*Watakame*] was *Tatzi Tehuiyari* (i.e., an inedible plant which resembles amaranth)" (ibid.). Once

Watakame had built houses for the maize goddesses, each one of them arrived and married a different animal.

White-Tailed Deer (*Odocoileus virginianus*)

In Wixárika cosmology, amaranth, deer, maize, and peyote are all interrelated spiritually and symbolically. Various people commented on deer symbolism when they heard that I was interested in amaranth. One friend talked about how when children eat powdered amaranth, they get it all over their faces and they look like little deer. He also suggested that in the time of the gods deer ate amaranth and that is why their faces are white on the sides.

Susana Valadez told me that Moctezuma, a *mara'akame*, and spiritual advisor for the Huichol Center, said that the white on the deer's face could be from white maize, but the white on the tail of the deer is from defecating after eating amaranth (personal communication: 14/06/04). I asked Imelda about this idea, and she said that, "many people say that the *K'uxa* leaf is like the tail of the deer, and when they run their tail looks like the amaranth leaf, we say the tail of amaranth" (personal communication: 22/07/04).

Discussion

In discussing the Rarámuri (an Uto-Aztecan indigenous group that lives in the northern Sierra Madre Occidental) cognitive model, Enrique Salmón describes how Rarámuri people believe that plants and animals were and are their relatives (2000: 190). For the Rarámuri, in a previous world people were part plant, so when they came to this current world, many of the plants came along and now live as humans in a different form. Some of the plants that are human (and that the Rarámuri believe they are related to)

include peyote (*Lophophora williamsii*) and maize (*Zea mays*). Salmón links the Rarámuri belief that they are related to plants to their way of seeing the natural world as being familiar, rather than wondrous (ibid.).

The Rarámuri example is similar to that of the Wixárika, in that they also believe that certain plants exist in human form. The maize maidens and Amaranth Boy behave like humans and humans are named after them. Living plants have the spirits of these human-like characters and give people their powers when consumed. These close relationships with plants and humans, and one can say ambiguity between plants and humans, demonstrate that Wixáritari, like the Rarámuri, view the natural world as being familiar and encompassing humans, rather than being wondrous, and separate from people.

Another insight that can be gained from examining Wixárika narratives regarding amaranth is that in "The History of Amaranth", Gonzalo said that, "...maize followed amaranth". The idea that amaranth came before maize supports the hypothesis that people domesticated amaranth before maize. According to Wixáritari, Amaranth Boy found the maize sisters, therefore amaranth came before maize. Also, in Fike's recorded version of "How Maize was Acquired", when Amaranth Boy arrived at *Takutsi's* house, she told her daughters that their brother had arrived, and the girls thought this was funny because he was so untidy (1985:291). Amaranth Boy's untidiness could be interpreted as the plant being untended, and wild because of his journey. As mentioned earlier in this chapter, various Wixáritari told me that one has to care for amaranth in the *milpa*, otherwise he will go back to the wild. Perhaps this was funny to the maize, because the girls were well-kept by their mother and therefore domesticated.

Both Gonzalo and Augustín talked about the persona of Amaranth Boy existing within the amaranth seed. Gonzalo talked about how the spirit of Amaranth Boy accompanies pilgrims on their journey to *Wirikúta*. He also stressed that the amaranth spirit sustains the pilgrims and provides the nutrition that they need. Interestingly, the need for the pilgrims to have amaranth with them on their journey mirrors the history of Amaranth Boy's walk to find maize. Amaranth Boy did not have maize, just as the pilgrims cannot eat maize until they arrive in *Wirikúta*.

Another interesting reference to amaranth in the above histories, is that in Augustín's version, he claims that along with the maize girls, there were several other plants that were to return with Amaranth Boy. However, Amaranth Girl did not want to go. Augustín did not say why this was, but perhaps the emphasis was put on her because of the emphasis on amaranth in general due to my inquiries about it. Also in Augustín's telling of the history, *Takutsi* did not want the girls to go with Amaranth Boy because she was afraid that the girls would get scattered. Preuss' recorded version of the history specifically points out that red amaranth did not want to go because she would be scattered, or thrown away (1996: 101). Wixárika people scatter amaranth seeds in the rocky *milpas* of the Sierra, as amaranth seeds sprout easily and do not need to be covered in soil. People often lose many of the tiny amaranth seeds while they are winnowing as well, and this could be another reason Amaranth Girl says that people throw her away.

Wixárika oral traditions provide insight into Wixárika traditional ecological knowledge. The close relationships between plants and people show that the Wixárika natural world is inseparable from their religion and daily lives. Narratives are a way of transmitting important information about what it means to be Wixárika. This discussion

of Wixárika ethnoecology of amaranth would not be complete without looking at the histories of Amaranth Boy. Next I will explore the Wixárika naming of amaranths, which relates to the final part of Toledo's framework and his perspective that knowledge, or *corpus*, is an integral piece of ethnoecological analyses. Then I will finish with a discussion of the significance of amaranth to Wixáritari ethnoecology in general, based on the above narratives, plant management, and the forthcoming linguistic classification.

¹ Word Augustín used in Spanish was "*arrieros*", which translates literally as "muleteers". Fikes refers to these people as "ant people" (1985: 288).

CHAPTER 4: KNOWLEDGE

In Victor Toledo's model of ethnoecology, the *corpus* refers to any given cultural knowledge base (2002). The *corpus* is the result of the synthesis of experiences shared over generations, between the members of a single generation, and within a domestic unit. People transmit knowledge via language. This chapter will focus on Wixárika linguistic classification and related knowledge of amaranth. As I do not speak Wixárika fluently, I elicited terms in both Wixárika and Spanish and obtained all explanations in Spanish. As one can imagine, this process was problematic and would have benefited by fluency in Wixárika. Nonetheless, some interesting patterns emerged in the Wixárika naming of the different amaranths present in their environment that contribute to a better comprehension of Wixárika ethnoecology.

Other factors that affected the data I was able to obtain on Wixárika classification and terminology, was my own social status, gender, and age and those of my teachers. As mentioned previously, Imelda Cruz de la Rosa was my principal teacher in linguistic classification. However, many individuals told me that the people that know the most about plant life are *mara'akames* because of their specialized knowledge regarding the natural and supernatural worlds. When I approached such individuals (who were all men), they were pleased to share narratives with me, but not as interested in providing plant names. Out of respect, I learned to avoid the topic somewhat and relied only on people who were willing teachers to tell me about plant names.

In 1976 Peter M. Gardner called for the informant's characteristics being accounted for in ethnobiological analyses (458). Variables such as age, sex, kinship background, fluency in native and other languages, amount of acculturation, and

community networks, all affect the informant's presentation and knowledge about linguistic classification (Ellen 1993: 126-148). Paul Sillitoe also notes that disagreements between different individuals' levels of knowledge regarding linguistic classification are likely based in different characteristics such as age and gender (2002: 1165).

It is also possible that individuals can develop their own categories in order to reflect their personal experiences and knowledge. Another problem in consistency is that individuals often equivocate on their own classifications, and can change their minds frequently. Roy Ellen describes how for the Nuauulu, available features of an organism such as habitat, morphology, behaviour, utility, and ideological position affect how an individual classifies an organism at any given time (1993: 142). For example, "[e]cological criteria may result in crustacea and catfish being lumped together, behavioural criteria might bring together dragonflies and honey-eaters, and ideology may join cassowaries and cockatoos" (ibid.).

The ability to gain cultural and cognitive insight through language is accepted by ethnobiologists, but it is disputed whether this insight pertains to humanity as a whole, or is restricted to the specific cultural groups studied. Ethnobiologists are split as to whether an underlying universal form of classification exists, or whether each specific classification system is only meaningful in its own specific cultural, ecological, and linguistic contexts. These differing perspectives will be explored in relation to Wixárika plant classification.

Ethnobiological Classification

As described in Chapter 1, the cultural classification of living things is a significant focus of ethnobiology. Willett Kempton names three assumptions that

ethnobiologists have used in their research (2001: 51). The first assumption is that if a group has extensive lists of words for a domain, then that domain must be of importance to them. The second assumption is that the names and categories that make up a domain reveal the development and use of items in a group's classification system. The final assumption is that when studies of groups are compared, they expose a universal human cognitive process that encompasses the wide range of varying cultural knowledge (ibid.).

There is some disagreement within the discipline of ethnobiology concerning this final assumption. Certain ethnobiologists (such as Brent Berlin 1992 and Scott Atran 1990), are often referred to as "intellectualists" and they believe that a universal classification system of all living things exists for indigenous societies (Berlin 1992). For example, Berlin states that:

...typological regularities found among systems of ethnobiological classification of traditional peoples... can be best explained in terms of human beings' similar perceptual and largely unconscious appreciation of the natural affinities among groupings of plants and animals in their environment—groupings that are recognized and named quite independently of their actual or potential usefulness or symbolic significance to humans (1992: xi).

Berlin acknowledges that biological diversity can be classified in various ways, but he argues that there are mainly unconscious classifications that reflect certain groupings because they present themselves to the individual as perceptually obvious (ibid.). Therefore, while people are capable of noticing diverse patterns within nature, a single pattern stands out from the existing plants and animals in the environment (ibid.). This single pattern is often called the "natural system" and according to Berlin, it is likely an innate ability of all humans to recognize and categorize organisms that are similar in physical structure (ibid.).

The specific categories of plants and animals that are the most distinctive and easily recognized are what Berlin calls folk generics (*ibid.*: 10). The categories that are more difficult to recognize and that signify groupings are life forms and folk species. Berlin provides twelve general principles of ethnobiological classification systems, based on his most recent work, the nine principles that he developed earlier with Breedlove and Raven, and on other people's contributions to the subject (especially those of Ralph Bulmer) (*ibid.*: 20).

Seven of Berlin's general principles refer to regularities in ethnobiological categorization, and the other five principles deal with patterns in ethnobiological nomenclature (*ibid.*). He separates these general principles into the two different sections in order to account for the distinction between people's psychological conceptualisations of plants and animals and people's linguistic reflections of this underlying structure (*ibid.*). Berlin reminds the reader that the twelve general principles characterize a large number of classification systems that belong to cultural groups from all over the world (*ibid.*).

The principles that describe ethnobiological categorization show that ethnobiological taxa tend to correspond with those acknowledged in Western science, although they are organized in a "shallow hierarchical structure" (*ibid.*: 31). In order to describe this structure, Berlin proposes six universal and mutually exclusive ethnobiological ranks, which are: kingdom, life form, intermediate, generic, specific, and varietal (*ibid.*). Other important points that Berlin makes regarding these universal principles are that some taxa have ideal prototypes, and the characteristics of the

organisms that people use to inform their classifications are independent from the cultural significance of the taxa in question (*ibid.*).

In relation to the last concept described above, one of the principles of ethnobiological nomenclature states that the names of flora and fauna "often metaphorically allude to morphological, behavioural, or ecological features that are nonarbitrarily associated with their biological referents" (*ibid.*: 35). The rest of Berlin's principles of nomenclature, mainly deal with specific patterns in the labelling of different taxa. For example, the first principle explains that the taxa within the kingdom rank are typically not named, while the third principle states that a particular relationship exists between the names of taxa and their rank (*ibid.*: 34).

In contrast, ethnobiologists such as Roy Ellen and Eugene Hunn believe that folk taxonomic systems are a result of cultural constructions and are therefore unique and relative to each group using them (Medin and Atran 1999: 8). Ellen suggests that one needs to carefully reflect on what is meant by "indigenous ethnobiological knowledge" in that there is a distinction between knowledge that is encoded in language and that which is not (1999: 91). He avers that formal knowledge is defined by the names that people have for plants and animals, and substantive knowledge refers to that which people can apply to activities that help them to survive (such as the regulation and extraction of resources).

After analysing data from people that live in Southeast Asian rainforests, Ellen concluded that not only are the size of ethnobiological inventories constrained by biodiversity (therefore those living in similar environments are expected to have similarities in naming regardless of subsistence strategies), but these inventories

(especially the fringe aspects) also reveal a history of contact and cultural sharing with surrounding peoples (*ibid.*: 109-110). Ellen emphasizes the fact that societies are not static and that groups living in small communities with a high turnover of members are less likely to have large amounts of shared knowledge and are more likely to have shorter terminological lists. Also, whether or not people are dependent on regular agriculture will affect their knowledge of cultivated or noncultivated resources. Discontinuities may come from agricultural intensification and subsequent marginalization of forest resources (*ibid.*).

Similarly, Claudine Friedberg suggests that we need to rethink the way we study folk classification (1979: 82). Friedberg believes that although the analysis of classificatory systems is interesting, it is important to take findings from a particular community and use them to gain greater insight into the culture from which they came (*ibid.*: 99). She claims that what can be gained by this approach is that one "goes beyond the problematic of perception towards a perspective from which we can hope to obtain information on how these communities have developed in time and space" (*ibid.*).

Other ethnobiologists have also taken a more intermediate position and believe that intellectualist and utilitarian views are not completely separate (*ibid.*). Ralph Bulmer is often cited as being an anthropologist who has been able to bridge the gap between ethnoscience and symbolic conceptualisation. For example, in his article entitled, "Mystical and Mundane in Kalam Classification of Birds", he looks at the common, general purpose classification of birds, and also discusses the tribal and mystical significance placed on particular categories of birds (1979: 57). Bulmer claims that if an ethnographer is attempting to comprehend the assignment of animals to culturally

significant classification, they must review each of the ritually significant categories within the culture being studied (*ibid.*: 58).

Emiko Ohnuki-Tierney describes some of the shared assumptions and goals between the supporters of ethnoscience and symbolic constructionism (1981). She notes that both ethnoscientists and symbolic constructionists use structural linguistics as a model for investigation (*ibid.*). Another similarity between the two approaches is that the structures that they seek are cultural systems of meaning (*ibid.*). These systems are separated from individual beliefs and thought processes and consequently do not require evidence that individual members of a society actually believe in or are aware of the proposed cultural systems of meaning.

Ohnuki-Tierney describes phases included in the processes of human perception, conception, and symbolization (*ibid.*). First of all is the initial perception of the external world and then the identification of the object in question. Next is the identification of the object within the cultural classificatory system. The object may take on some further symbolic meaning, and then finally the symbol becomes an icon. Cognitive anthropologists deal with the first three phases, and those that study symbolic classification deal with the final three phases (*ibid.*: 463). Therefore, she claims that each of the two divisions in ethnobiological methods are in fact participating in a division of labour, and ultimately contributing to the final goal of understanding the processes of human perception, conception, and symbolization (*ibid.*).

Another perspective is that of Gregory Forth, which demonstrates that while a generally universal ethnotaxonomic system of classification exists, there are also useful symbolic classification systems that are independent of ethnotaxonomic relations (2004).

He claims that when dealing with cultural significance, ethnobiologists need to distinguish between utilitarian value and symbolic significance. Through this distinction, Forth shows that the Nage (a small-scale agricultural group living on the eastern Indonesian island of Flores) have "a distinct kind of symbolic knowledge of birds", and therefore have a form of symbolic classification that is different from ethnotaxonomic relations (*ibid.*: 4). This means that while Nage people have a classification system that conforms to accepted universal principles of ethnobiological classification, they also have a system of symbolic classification that reflects their social structure. Wixáritari also appear to have both ethnotaxonomic and symbolic forms of linguistic classification of plants.

Wixárika Ethnobiology

While recounting his experiences in trying to uncover Wixárika plant classification David Price claimed, "...it occurred to me that perhaps there were no generic terms like 'tree' in the Wixárika ethnobotany, but only words for particular combinations of distinct attributes, like 'trunk'. If this were the case, it would be impossible to make sentences like, "The pine is a kind of tree." One would have to say "The pine has a trunk." (1967: 4). Price concluded that Wixárika taxonomy does not fit into the "specific-generic, sub-class-super-class" model, and that while Wixárika classification has a relationship of complementarity within levels, there is no relationship of inclusion between levels.

A relationship of complementarity is one in which items in a level are mutually exclusive, while a relationship of inclusion means that all members of one level are members, or kinds of, the level above them. Delineating a relationship of inclusion can

become confusing when the name of an item on one level, is also the name of an item on the next level above or below the item. According to Price, Wixárika ethnobiological classification is not inclusive because, for example, if one level refers to a plant that has a supporting member and the subsequent lower level refers to the plant having a large or a small supporting member, then the items in the lower level are not kinds of supporting members, but descriptions of kinds of supporting members (ibid.: 4).

However, Wixáritari often use cover terms for attribute clusters such as stem, trunk, or vine. Therefore an individual will say, "Amaranth has a main part, or stem", rather than "Amaranth is a herb". Attribute clusters suggest a relationship of inclusion for plant classification, because, for example, plants that have trunks are types of trees. Leslie M. Johnson-Gottesfeld and Sharon Hargus found that Wet'suwet'en people have a linguistic polysemy between the terms that translate to "tree", "woody shrub" and "stick" (*dacən*) (1998: 79). The authors note that like the Wixárika example, Wet'suwet'en people identify trees as plants that have wood, but this does not reveal a lack of relationship of inclusion, because plants that have wood, are in fact, kinds of trees.

Regardless of whether or not levels have relationships of inclusion in Wixárika plant classification, the relationship of upper levels to lower levels is one of less specificity to more specificity, so that levels are defined by descriptive factors. For example, the levels of classification of amaranth from largest to smallest levels are: it has a main part that is rigid, it is not distinctly hollow, it has a bitter, tough or woody stem, the stem is a permanent part of the plant, the plant has leaves, the plant has fruits, and the fruits have seeds (see Figure 4.1). Upper levels typically describe a type of item, while the lower levels provide more and more detail to the original description.

Cecil H. Brown terms the "part of" hierarchical relationships that some people (such as Wixárika) use partonomies, which he opposes to the "kind of" relationships that some people use in taxonomies (1976). A parton, which may or may not be labelled in a language, "is part of an entity and is described as "possessed by" that entity...and can possess a parton or parta (pl.)"(ibid.: 401). That is, a parton, or part of a thing, can in turn be further broken down into smaller constituent parts. The whole constitutes the first hierarchical level of a partonomy, which Brown refers to as "Level 0" as opposed to "Level 1" because the whole is not a parton.

Joseph E. Grimes has published extensively on Wixárika linguistics, and is one of very few authorities on the topic. Grimes worked entirely in Wixárika. In 1980, he produced two subsequent articles on Wixárika life form classification that support the idea that Wixárika use a partonomic system of ethnobiological classification. Grimes found that Wixáritari use some nouns that name life forms (such as trees, shrub, vines, or grasses), but he did not find any Wixárika terms for kingdoms (1980: 187). My findings are similar on both accounts, as Wixárika people identify the life form that amaranth belongs to as grasses, or herbs, which translates to *tupiriya* in Wixárika, but they do not have a word for "plants". Grimes acknowledges that in general, Wixárika have various clear and obvious taxonomic groupings that are identified by attributes, and are expressed by complete sentences or verbs (ibid.).

Being fluent in Wixárika helped Grimes to make insightful discoveries about Wixárika classification. He suggests that the key to understanding and elucidating Wixárika ethnobiological classification is understanding the term, *iváa*. *Iváa* refers to

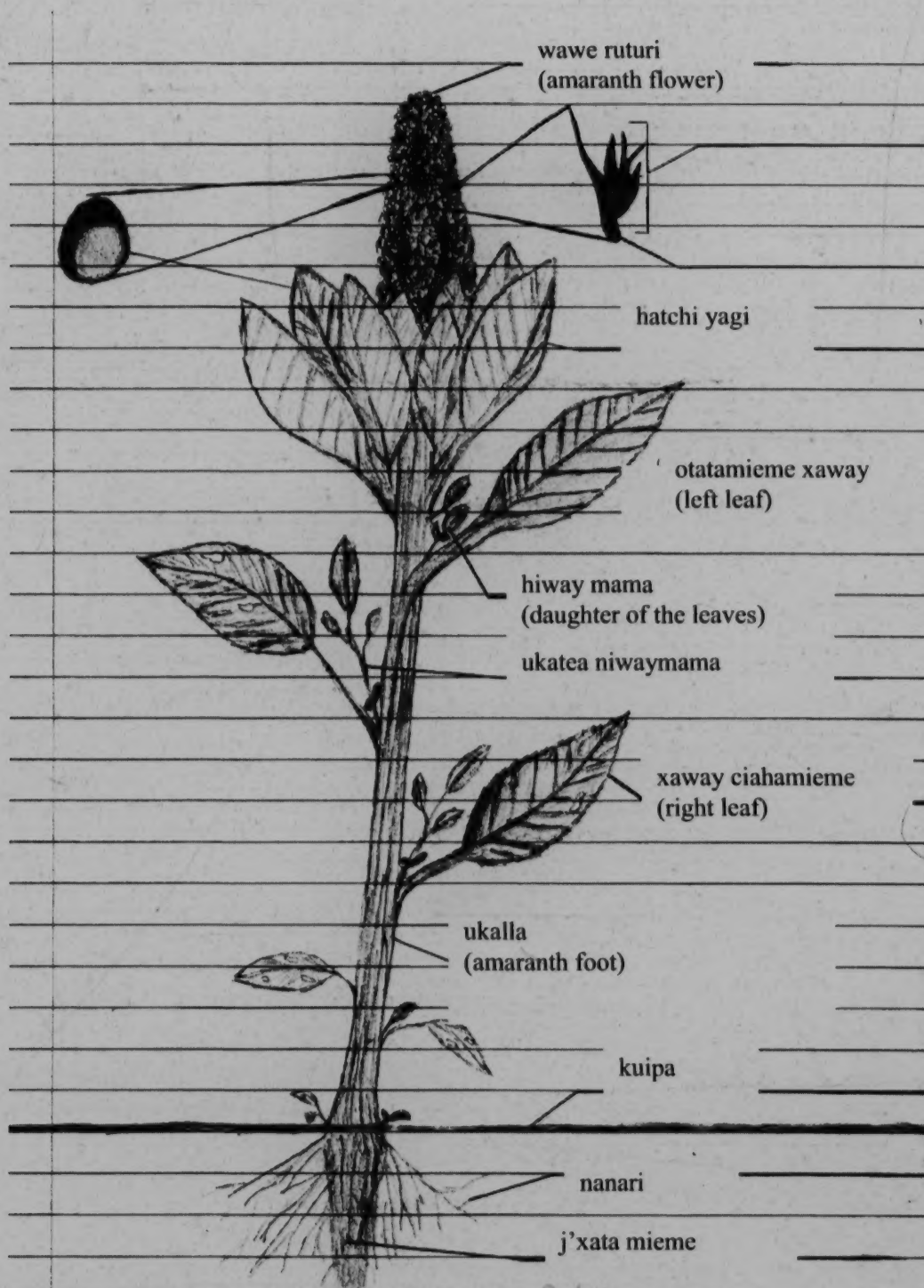


Figure 4.1: Defining parts of *A. hypochondriacus* (not to scale)

individuals with any gender that are related by ties of blood and are from the same generation (ibid.: 188). Therefore individuals who are siblings or cousins fit this description. When one applies this term to beings that are not necessarily human, it means that they share characteristics of appearance or behaviour, or one could say that they are related.

Eugene Hunn and David French describe how Sahaptin people also metaphorically display ethnobiological relations of coordination through human or social kinship relations (1984: 77). For example, Sahaptins say that dogs, coyotes, and wolves are relatives, or friends of one another. Nancy Turner illustrates how Thompson and Lillooet Interior Salish people name certain plants by other plants that are their "relatives" (1989: 85). For example, plants that are morphologically similar to kinnikinnick are referred to as "friends, or relatives of kinnikinnick" (ibid.). Questions that Grimes recommended that the researcher use when investigating Wixárika ethnobiology are: "What are its siblings?", "What shows that they are its siblings?", and "How do you tell one sibling from another?" (1980: 188).

During the beginning of my research I had similar problems as Price in that asking for direct translations for words such as "plant" or "tree" was fruitless. It was also a frustrating and confusing endeavour for both myself and my teachers to try to explicate what type of plant amaranth is, or what groups it belongs to. Types of related amaranths, or folk varietals, meanwhile, were easy for Wixáritari to list. These plants have descriptive names, which are mainly based on the colours of marks on their leaves, or the ecological conditions in which they grow. For example, one type is named after the fact that it most often grows in cow manure (*k'uxa temuuquítáa ucári*).

In his Ph.D. thesis, James Bauml lists Wixárika names and uses for folk varieties of each of the two species of amaranths found in Wixárika territories (1994). I used Bauml's lists as a base for gaining lists of "children" of the two amaranths (see Figures 4.1 and 4.2). *A. hybridus* has at least eight folk varieties and *A. hypochondriacus* has at least seven different folk varieties. Also, several of the varieties of amaranth have different names for male and female plants, and descriptions of plants are often based on morphological features such as the colours of flowers and seeds and taste of leaves.

<i>A. hypochondriacus</i>	
Wixárika	English
wawe xiituenime ucáari	has many hairs
úusa wawe	all red with white seeds
wawe méexúucame	the ones that come most quickly and early
wawe muyuuyuvi temuquitaa uqisi	has black seeds
wawe waawéemi	the one that grows to be the largest

Table 4.1: Wixárika folk varieties of *A. hypochondriacus*

<i>A. hybridus</i>	
Wixárika	English
k úxa uqisi	many grow in the Sierra
k'uxa ucáari	the smallest
k'uxa temuquitaa	has coloured (red) leaves
k'uxa ranea'utuca	has painted leaves
tuxaame curanca'utuca	has leaves with white spots
xuxuure mucúranca'utuca	has leaves with red spots

Table 4.2: Wixárika folk varieties of *A. hybridus*

Another interesting linguistic distinction that Wixárika people make is between domesticated and undomesticated plants. Plants from the mountain, or *xartknuk*, are undomesticated plants, such as *A. hybridus*. Plants from the house, or *itari*, are domesticated plants, such as *A. hypochondriacus*. Plants are classified with the same partons, whether or not they are domesticated, as many Wixáritari recognize that *A.*

hybridus and *A. hypochondriacus* are related. The difference in naming of domesticated and undomesticated plants lies in a further breakdown of names given to domesticated plants described in the following section. Nutritionally and religiously important domesticated plants to Wixáritari have different names for each of the distinct growth and processing phases of the plant. Some of the important plants with named phases include beans (*Phaseolus* spp.), maize (*Zea mays* ssp. *mays*), squash (*Cucurbita* spp.), and amaranth (*A. hybridus* and *A. hypochondriacus*).

Wixárika use of Phena

For a people whose ethnobiological classification focuses on partonomies, it seems reasonable that important domesticated plants have names for the plants as different parts develop, or are emphasized. Wixárika people consider each of these name phases, or phena, to be a specific plant, while recognizing that each of the plants experiences a metamorphosis through ontogenesis (see Tables 4.3 and 4.4). Ernst Mayr and Peter D. Ashlock define a phenon (phena pl.) as a group of phenotypically similar specimens, that are different from the dominant population (1991: 424). Some of the characteristics that delineate a phenon in a population include sexual dimorphism, age, and seasonal variation (1991: 55).

Daniel Clément has explored the existence of phena in Montagnais zoological classification (1996). He found domains of variation in age, sex, seasonal variation, habitat, habits, morphological features and abnormalities (ibid.: 493). Each phenon is defined by few and obvious attributes, and can reproduce with other phena of the same species, and not with phena of other species. Clément's findings differ from what I found in regard to Wixárika use of phena, as Wixáritari acknowledged that the mature forms of

the plant produce the seed, which sprouts, so that each phenon is not interbreeding. This is consistent with the biology and life cycles of mammals on the one hand, and monoecious plants (those which have flowers with both male and female parts on the same plants) on the other.

Wixárika name their children after phena (see Tables 4.3 and 4.4). Both women and men are named after plant phena, but there is certainly a focus on naming girls after maize and amaranth. All of the names displayed in Table 4.3 below are those of females. Schaefer claims that such names reinforce the strong relationship between femininity and gestation, birth, and growth (2002: 212). Female maize growth phase names (as well as naming women after the different colours of maize and subsequent goddesses) also reflect the Wixárika religious symbolic association between females and maize. While telling me about how her mother is named after the seed of *A. hypochondriacus* (Waweama), Imelda Cruz de la Rosa explained how, "we say births are fixing our ancestors in the birth" (personal communication: 07/22/04), meaning that people are manifestations of the Wixárika ancestor deities.

Jay Courtney Fikes stresses that the metaphoric correspondence between Wixárika people and maize directly relates to the narrative about how Amaranth Boy first found the maize maidens (1985: 245). Maize was originally in the form of girls and the

Phase	Wixárika	Person's Name
Seed	Wawe	Waweáma, Wawema, Waweama
To scatter the seeds		Tuuwi
Has small leaves	K'uxa	
Has large leaves to eat	Rawai	Rawaima
Seeds arrive (6 mos)	Huasoli	
When flower is ready to harvest	Xuturi	

Table 4.3: Wixárika amaranth phena and related personal names

Phase	Wixárika (Torres 2000: 141)	Person's Name (Schaefer 2002: 283)
General name for maize	Iku	
Planted seed – to grow	Nemikaene	Y+rama, Y+ra
Maize sprouting (born)	Etzhi, Etzina	Hakarima
Two days after sprouting	Jomurima	
Three days after sprouting	Wenima	
Has three leaves	Noka	Turama
Large plant with four leaves	Washa	Tsaulima
When it has a tassel	Jairama	Xutuima
When it is gleaning	Muayama	Tsulima
When ears first emerge		Xitaima
When the cobs are mature	Shaurima	Xaurima
When one picks the maize	Ikataepuka, Itzama	
When one shells the maize	Neptiuni	
When the maize is dried (<i>Nixtamal</i>)	Tetzo	'Utsíma
When one grinds the maize	Nepelya	
When the maize is made into a tortilla	Papa	

Table 4.4: Wixárika maize phena and related personal names
(bolded terms are those confirmed by my teachers)

interchangeability in the naming of maize and girls reflects this. The literal original sameness of girls and maize now acts as a metaphor of respect and veneration. "The mutualism existing between Huichols and maize is dignified in this origin myth and confirmed each time they call a person by a name matched with a specific stage in the growth of maize" (ibid.). Interestingly, my teachers were not able to elicit names for males that relate to amaranth, as one might assume from the narrative. While different people said that male names related to amaranth exist, and there are male names reflecting other plant names, such as beans, one must remember that Amaranth Girl was present amongst the daughters at *Tatuksi's* house, and therefore may be more often thought of as feminine.

Discussion

Wixárika plant classification includes a number of overlapping and intersecting ways of considering morphological, ecological, and phenological variation. Two important ways that Wixáritari consider this variation are via utilitarian and symbolic classification. Wixárika taxonomic classification is defined by a partonomic system that often reflects utility in its focus on specific plant parts. A partonomic classification system consists of descriptive hierarchical levels of specificity that reflect "parts of" relationships, or partons. Partons are identified by attribute clusters, which are labelled by verbs, such as "tastes hot", complete sentences, such as "its sap is not poisonous" or cover terms, such as "herbs".

This focus on parts of plants reveals the importance that Wixáritari place on the morphology and ecological variation of particular plants. For example, amaranth is classified according to its distinct parts, such as the nature of its stem, leaves, flower, and seeds. Many of the folk varieties of amaranth are named according to their morphological and ecological variation. For example, two different varieties are named "has leaves with white spots" and "many grow in the Sierra".

At the same time, Wixáritari have another form of classification for religiously and nutritionally significant domesticated plants. Phenon are ages, or growth and processing stages of plants that Wixárika people name and consider to be discrete plants. These plants cannot interbreed, and they symbolically represent human-deity relationships. Interestingly, it is just domesticated and similarly religiously significant plants, such as *A. hypochondriacus*, that have phenon – based names, while other plants that have simply nutritional or other utilitarian significance, such as *A. hybridus*, do not

appear to have phenon-based names. As Forth demonstrates, ethnobiologists need to consider the difference between utilitarian and symbolic significance when dealing with linguistic classification issues surrounding cultural significance (2004).

Wixárika ethnobiological classification appears both to conform to the accepted ideas of folk taxonomy, and to have a system of symbolic classification that reflects significant social aspects of Wixárika life. For example, the phena that identify plant age phases are also used as names for people who are born when the plants are exhibiting these phases. In the cases of amaranth and maize, women are typically named after the plants' different phena. A mutualism exists between Wixárika and religiously significant plants. For example, those plants that have spirit personalities and are the protagonists of oral traditions, such as Amaranth Boy, act as spirit guides and represent real people.

Knowledge in the form of linguistic classification can provide a great deal of insight into a particular indigenous group's ethnoecology. Toledo's framework for ethnoecological studies proposes that *corpus* represents people's knowledge gained through experiences that are achieved and shared over generations throughout annual agricultural and ceremonial cycles (2002). The following and final chapter will provide an overview of Wixárika ethnoecology based on Toledo's framework. The significance and representation of amaranth in Wixárika ethnoecology will be explored in detail. I will then close with suggestions for future research.

CHAPTER 5: DISCUSSION

Summary

This thesis is based on three months of fieldwork that I carried out in the summer of 2004 in the town and surrounding area of Huejuquilla el Alto, Jalisco, Mexico. I had the support of the Huichol Center for Cultural Survival and Traditional Arts, which provided me with lodging, access to its ethnographic resources, and introductions to Wixárika (Huichol) community members. I interacted with and recorded informal interviews from people in Spanish, and translated the material into English. Key teachers, or informants, who taught me about amaranth were a diverse range of individuals with differing ages, genders, and levels of religious specialization.

Due to conflict, isolation, and the rugged geography of the Sierra Madre Occidental, Wixáritari have maintained much of their traditional customs, in spite of the Spanish colonization of Mexico. Wixáritari live in governmentally recognized and communally owned territories that span the states of Nayarit, Jalisco, Zacatecas, and Durango. Although almost half of Wixáritari now work outside of their communities, they return to their homesteads for major events in their agricultural and ceremonial cycle. Bilateral, extended families possess homesteads that succeeding generations inherit provided that they work the land that is given to them.

Wixáritari maintain their land through shifting agriculture. The major crops that they grow in their *milpas* (small crop fields) are maize (*Zea mays* ssp. *mays*) and beans (*Phaseolus* spp.). In particular, maize is religiously significant for Wixáritari, because they venerate a maize, deer, and peyote complex. Religious authorities are known as *mara'akames*, and these people act as leaders, shamans, healers, and priests. A majority

of people participate in religious life, by taking part in ceremonies, but also by living their daily lives, or "the good life". One of the ways in which people worship their many ancestor deities are by making brightly coloured offerings from beads, wax, woods, and gourds.

The landscape of the Wixárika homelands is diverse, because of the deep canyons that transect the region. The Chapalagana River winds through the Wixárika Sierra, and has eroded steep slopes that range from approximately 700-3000 meters above sea level. The lower regions of the canyons have tropical vegetation, while at the other extreme the upper regions have highland plains. A dry season lasts generally from December to June, and people cultivate crops during the rest of the year, which is the time of the rainy season. Besides cultivated plants, Wixáritari gather various wild, and often altered, or managed plants that comprise a nutritionally significant part of their diets.

Amaranth is one of the plants that Wixárika people both cultivate and gather. Wixáritari grow the domesticated, *Amaranthus hypochondriacus* for its seeds, and collect young leaves from the undomesticated, *Amaranthus hybridus* to eat during the time of year when maize supplies and stores of other cultivated plants are low. Wixárika grow *A. hypochondriacus* in their *milpas* and harvest its tiny, protein rich seeds in order to use them for ceremonial and culinary purposes. This practice is fascinating because it is a lasting tradition from Aztec times. Wixárika isolation supported their continued ceremonial and nutritional use of amaranth, whereas in other parts of Mexico, the Spanish prohibition of Aztec religious traditions suppressed the religious use of amaranth seeds.

In order to investigate the significance of amaranth for Wixárika people, I relied on Victor M. Toledo's framework for ethnoecological studies to guide my investigations

(2002). Ethnoecology is study of the interactions between people and all of the ecological aspects that they come into contact with in their environment. Toledo envisions ethnoecology as a discipline that investigates culture, production, and nature as a part of a landscape. Ethnoecology is therefore an interdisciplinary approach that explores the *praxis* (set of practices), the *kosmos* (belief system), and the *corpus* (cognitive systems) of a group of people.

The second chapter of this thesis examined the *praxis* of Wixárika ethnoecology by discussing Wixárika agricultural practices and management of the amaranths available in their environment. As mentioned above, Wixáritari practice shifting agriculture, which is regulated by community land use rights. Field crop plots, or *milpas*, are used for approximately five years, and then left fallow for at least five years. Clearing *milpas* is very labour intensive and large work groups participate in clearing during the months of March through May. The order in which the labour groups clear the fields depends on the status and ranking of plot-users within a homestead, with higher-ranking individuals having their *milpas* cleared first. The Wixárika agricultural cycle is closely linked with their ceremonial cycle, and labour groups need to participate in the appropriate rituals in order to ensure abundant crops.

While labour groups differ in size depending on the task, participating in them is a social and pleasant time. Besides clearing *milpas*, these groups also sow maize and other important crops, and help to weed, or clean out the *milpas*. Individual households also maintain garden plots, where they grow vegetables and fruits, but they care for these gardens casually, and tend them after work is finished in the *milpa*.

One plant that grows readily in areas with disturbed soil, and consequently the *milpa*, is *A. hybridus*. Wixáritari allow this plant to grow in their *milpas* until it is the proper size to be picked and taken home to be eaten. Therefore, *A. hybridus* is not considered to be a weed for Wixáritari, but instead a reliable resource that they manipulate and manage as a food source without having to cultivate it. *A. hybridus* flourishes in areas where people have disturbed the soil, and so the plant benefits from people's interactions with their environment. A long standing relationship between *A. hybridus* and Wixáritari has likely influenced the evolution and ecological distribution of *A. hybridus*.

Chapter 3 of this thesis focused on the domesticated form of amaranth that grows in the Wixárika Sierra, which is *A. hypochondriacus*. The seeds from this plant have deep religious significance for Wixárika people. The beliefs or *kosmos* that Wixáritari have concerning their surroundings helps them to ensure ecological order. This is because traditions (often shared through narratives or oral traditions) dictate how people need to participate in ceremonies and daily life through proper conduct. Proper conduct includes wisdom on how to sustain oneself in the particular Wixárika environment, and generally how to interact with the environment appropriately.

I provided narratives from three principal Wixárika teachers in order to observe the Wixárika *kosmos*. I gave backgrounds on each of my teachers, and then presented translated versions of different oral traditions and perspectives on amaranth that they provided. The major personality in Wixárika oral traditions regarding amaranth is *Watakame*, or *Wawe Temay*. Both names refer to the same character, and they translate to "Clearer of the Fields" and "Amaranth Boy" respectively. This ancestor deity is an

important character in Wixárika oral traditions because during the time of the gods he went looking for maize. He eventually found the five maize maidens and brought them back to his home, and learned how properly to care for them. Part of properly caring for maize includes hunting for deer and making offerings, and going to *Wirikúta* (in the deserts in the state of San Luis Potosí) to gather peyote, which is a manifestation of the maize goddess, *Niwetsika*.

My teachers also described the ceremonial use and symbolism regarding amaranth. Wixáritari believe that the spirit of Amaranth Boy lives inside of the amaranth seed, and that each time a seed is planted, Amaranth Boy is born. The spirit also lives in the powdered form of the seed that peyote pilgrims take with them on their journey to the desert in San Luis Potosí. Powdered amaranth is the only thing that people are allowed to eat on their journey, and they believe that Amaranth Boy's spirit guides and sustains them on their important journey so that, like Amaranth Boy, they can find peyote in the religious site of *Wirikúta*.

Women use amaranth flour to make little balls for various different religious ceremonies. The balls are used as part of ceremonies, and often symbolize the fruits that fall from an undomesticated type of maguey (*Agave guadalupensis* Trel.), or the beads from a rosary. Once they have been used in the ceremonies that they were made for, people eat the amaranth balls, which are sweet and sticky. Many Wixárika recognize the nutritional importance of amaranth seeds, and they equate this value to the power of the spirit of Amaranth Boy. Amaranth Boy is also of importance because he found maize, which supports the idea that amaranth was domesticated very early in Mexico, and likely before maize.

Amaranth metaphors surrounding white-tailed deer (*Odocoileus virginianus*) are also interesting. Some Wixáritari believe that the white on the deer's face and tail is a result of it eating the white powdered form of amaranth seeds. Children are thought to look like the deer when they eat powdered amaranth, because they get it on their cheeks, just like the white-tailed deer. The shape of the white-tailed deer's tail (especially noticeable when the deer is running), is also thought to resemble the shape of an amaranth leaf.

In respect to Toledo's framework for ethnoecological studies, Chapter 4 dealt with the *Corpus*, or Wixárika knowledge surrounding amaranth. Knowledge or the classification of a people's surroundings can be elicited through the investigation of linguistic classification, or ethnobiology. Knowledge is passed down via language over many generations and is a combination of an individual's personal and culturally shared experiences. Chapter 4 uncovered some of the governing principles of Wixárika plant classification by analysing particular examples from amaranth classification in Wixárika.

Two striking patterns emerge from examining Wixárika plant classification. First of all, Wixárika people use a partonomic system of plant classification. This means that hierarchical levels of classification are described by "parts of" relationships that depict different attributes of plants. Attribute clusters, or partons, are named with verbs, sentences, or cover terms. These descriptive names often focus on morphological, ecological, and utilitarian aspects of plant parts. For example, amaranth is classified according to the nature of its stem, leaves, flowers, and seeds. Some of the defining characteristics of varieties of amaranths are the colour and presence of marks on the plant's leaves.

Wixáritari also have a form of classification for religiously and nutritionally significant domesticated plants that focuses on plant phenology. Phená, or different ages of a plant are named as individual plants. People are often named after these phená if they are born at the same time that a plant with this name is present. For example, if *A. hypochondriacus* (wawe in Wixárika) is producing its ceremonially and nutritionally important seeds at the time of her birth, then a woman is typically named *Waweama*. Wixáritari believe that Amaranth Boy lives within the seed, and so when an individual is born and named after Amaranth Boy, his spirit lives within that person.

Wixárika Ethnoecology of Amaranth

The two species of amaranth found in the Wixárika Sierra are useful for many things. Through examining Wixárika practices, beliefs, and knowledge regarding amaranth, it is clear that the three topics are deeply intertwined in Wixárika ethnoecology. In particular, *A. hypochondriacus* is cared for and revered because it is the manifestation of the ancestor deity, Amaranth Boy, and *A. hybridus* is managed as an important food source for times of famine. Religious emphasis placed on the seed ensures that people will continue to cultivate *A. hypochondriacus*, and oral traditions are passed on to ensure the succeeding generations will know how to properly cultivate and manage amaranth.

By applying Toledo's framework for ethnoecological studies, I was able to investigate an encompassing range of ethnoecological aspects of Wixárika classification and management of amaranth. Culture, production, and nature are inseparable domains of landscape that inform a cultural group's interaction with their environment. Wixárika *praxis* regarding amaranth involves a complex social tradition of labour groups that

maintain field crops through shifting agriculture. Areas with disturbed soil are a part of agricultural management, as Wixárika people allow valuable food plants to grow so they can be harvested in times of need.

Wixárika people's *kosmos* is best examined through their many oral traditions, which teach people proper religious and ecological conduct. Important religious and ecological knowledge is passed on via these traditions, and so ensure that Wixárika continue their unique ways of life. *Corpus*, or knowledge about Wixárika people's environment is stored in language and can be elicited through analysing Wixárika ethnobiological classification. The different utilitarian and symbolic forms of plant classification that Wixárika people use provide insight into how they perceive and interact with amaranth.

Toledo's *praxis - kosmos - corpus* complex is a valuable tool for examining Wixárika people's intellectual and material interactions with their environment. These interactions are expressed through the landscape (through natural memory) and in the minds of Wixáritari (through human memory). Wixárika people revere amaranth as it contains the spirit of Amaranth Boy, who first found maize and peyote, which are central in both cosmological and subsistence cycles. Wixáritari also acknowledge the nutritional value of amaranth as a food source and take pleasure in cultivating and managing it.

People name their children after the seed and consume it during the crucial peyote pilgrimage. People allow the leaves to grow in areas with disturbed soil so that they will have a supply when other food stores are low. Close Wixárika relationships with humans and plants demonstrate that Wixáritari view the natural world as being familiar and encompassing humans, rather than being wondrous, and separate from daily life.

Through examining the Wixárika ethnoecology of amaranth, it is clear that the Wixárika religion transmitted via language informs the individual on how to interact with the environment appropriately and therefore to maintain a unique and salient way of life.

Future Research

Although a number of significant studies that explore aspects of Wixárika ethnoecology have been carried out, an integrated investigation that considers cosmology, ethnobiology, and land management has yet to be carried out. This thesis is an initial step that explores the significance of a particular group of important plants, but much remains to be done.

Previous studies that relate to Wixárika ethnoecology include Peter T. Furst's (1968) essay on the parching of the maize ritual and Barabara Myerhoff's (1974) discussion of the Wixárika peyote hunt. More recently Ph.D. dissertations by James Bauml (1994) and Jay Courtney Fikes (1985) have approached some aspects of Wixárika ethnoecology. From a botanical perspective, Bauml's dissertation focuses on Wixárika ethnobotany, and in particular that of marigolds (*Tagetes erecta*). He also provides an extensive list of plants that Wixárika use, and describes whether they use the plants as arrows or bows, beverage or beverage additives, cordage or fibre, dye or paint, food or food additive, glue or adhesive, medicine, poison (including piscicide), religious or ceremonial items, soap, utensils, household articles, or toys, wood for construction, firewood, or ash (1994). Bauml's thesis contains some Wixárika plants names, but does not discuss Wixárika classification of plants.

Fikes' dissertation on "Huichol Indian Identity and Adaptation" involves an in-depth analysis of Wixárika religion (1985). Wixárika religion instantiates their

ceremonial and agricultural cycle, and therefore is integral to their ethnoecology. However, Fikes does not consider daily Wixárika agricultural practices or their linguistic classification of their surroundings nor how these aspects relate to their unique ecological perspective. Both David Price and Joseph Grimes have investigated Wixárika linguistic classification, but neither of them provided a fully-descriptive analysis of Wixárika ethnobiology. While Grimes' work is insightful, he admits that his ethnobiological studies are preliminary, and that he has a preference for animals over plants, so his lists of Wixárika plant names are scarce (1980).

A full-scale investigation of Wixárika ethnobiological classification is needed in order to gain a better picture of how Wixáritari conceptualise their environment. More research is necessary that takes Wixárika people's social status such as age, gender, and religious roles into account, and that is done in the Wixárika language. A study that considers the Wixárika ethnobiological classification of plants, animals, and landscape, combined with their perspectives on religion, agricultural practices, and resource management would be the most productive approach. As a relatively non-syncretic Mexican indigenous people, Wixáritari provide a unique opportunity to examine religion and ecology in a traditional context.

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APPENDIX A: PHOTOGRAPHS



Photo 1.1: *A. hypochondriacus* flower Photographer: Candelario Vásquez Loyo



Photo 1.2: Theresa grinding *A. hybridus* leaves for tortillas



Photo 1.3: Yesenia planting maize

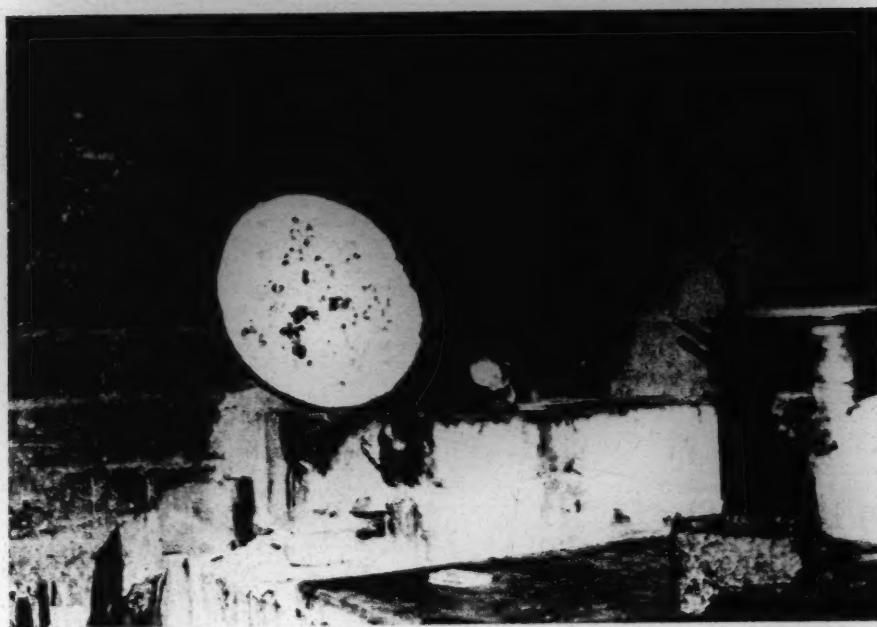


Photo 1.4: *Comal*, a traditional Wixárika griddle



Photo 1.5: *A. hypochondriacus* leaf



Photo 1.6: *A. hybridus*



Photo 1.7: Gonzalo making a yarn painting



Photo 1.8: Imelda watching her son, Samuel clear family compound



Photo 1.9: Augustín (right) and his father, Pablo

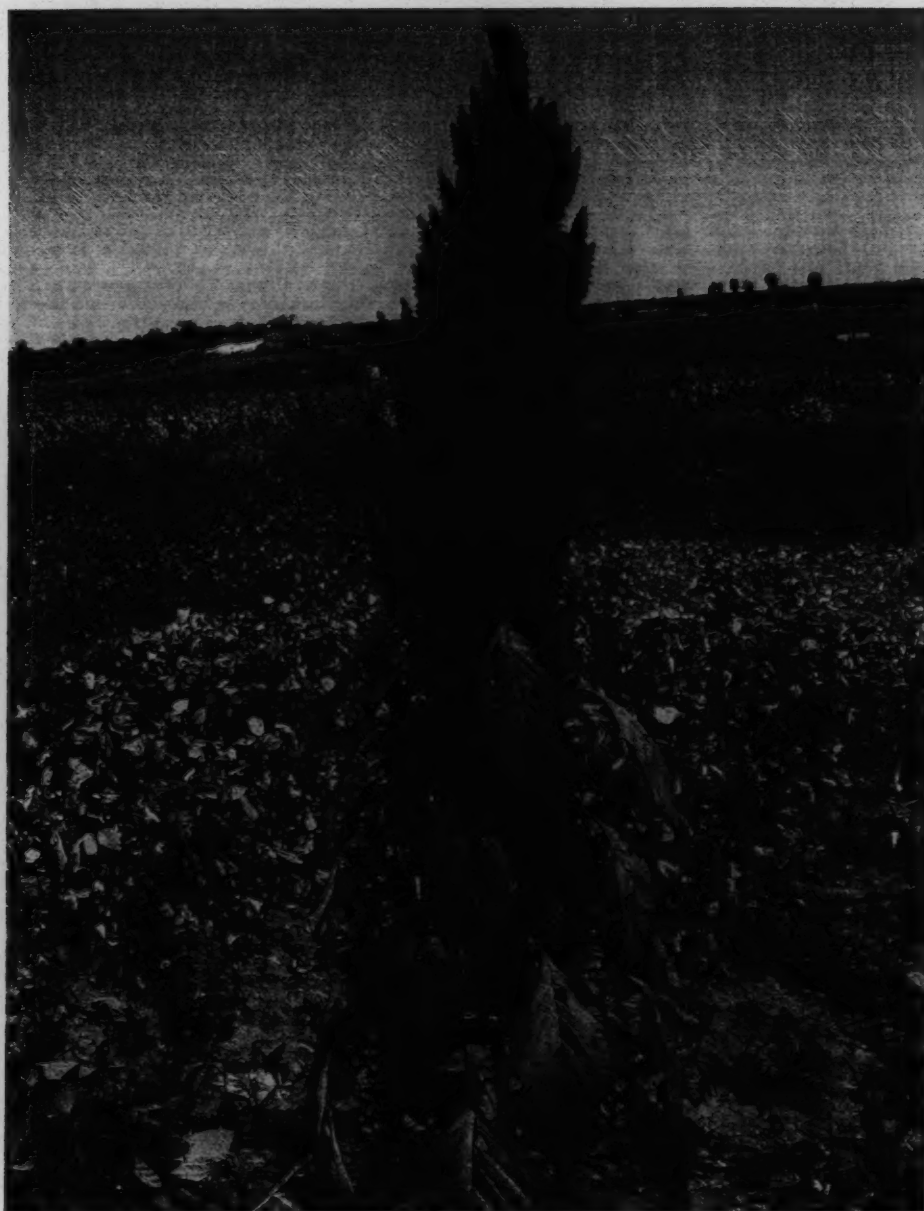


Photo 1.10: Mature *A. hypochondriacus* Photographer: Candelario Vásquez Loyo